THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. X. OF VOL. II., 1932. LONDON, SATURDAY, SEPTEMBER 3, 1932 Pp. 112 — Price 1s.
No. 5688. Vol. CCXXIII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 2

DISEASES OF THE RECTUM AND COLON

AND THEIR SURGICAL TREATMENT.

BY

J. P. LOCKHART-MUMMERY,

F.R.C.S. ENG., M.A., M.B., B.C. CANTAB.,

Senior Surgeon to St. Mark's Hospital.

Over Two Hundred Plates and Illustrations. Price 25s.

Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

FRACTURES.

By MEURICE SINCLAIR, C.M.G., M.B., CH.B. (EDIN.)

With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S.

Pp. 550. 337 X-Ray photographs, photographs and diagrams. 24s. net.

Constable & Co., Ltd., London.

MOTIVES AND MECHANISMS OF THE MIND

By E. GRAHAM HOWE, M.B., B.S.,

Hon. Phys., Tavistock-square Clinic for Functional Nervous Disorders.

Pp. 280. Demy 8vo. 10s. 6d. net.

FIRST VOLUME OF THE POST-GRADUATE SERIES.

THE LANCET LTD., 7, Adam-street, Adelphi, London, W.C.2

BY LIEUT.-COL. ROBERT HENRY ELLIOT

M.D., B.S. Lond., F.R.C.S. Eng., I.M.S., retd.

A TREATISE ON GLAUCOMA.

2nd Edition, Revised and Enlarged. 30s. net.

TROPICAL OPHTHALMOLOGY.

With 7 Plates and 117 Illustrations. 31s. 6d. net.

Spanish and French Editions, 1922. Full German Abstract.

THE CARE OF EYE CASES: 12s. 6d. net.

MANUAL FOR NURSES, PRACTITIONERS, AND STUDENTS

Chinese Edition. Oxford University Press.

GLAUCOMA 4s. net.

A HANDBOOK FOR THE GENERAL PRACTITIONER.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.

7s. 6d. net. H. K. Lewis and Co. Ltd.

Just Published.

THE PRINCIPLES AND PRACTICE OF PSYCHIATRY.

By ALEXANDER CANNON, M.D., Ph.D., D.P.M., and E. D. T. HAYES, M.D., D.P.M.

Foreword by Professor J. SHAW BOLTON, D.Sc., M.D., F.R.C.P.

Crown 4to. With over 100 illustrations in the Text and 14 half tones. 25s. net.

William Heinemann (Medical Books) Ltd.,
99, Great Russell-street, London, W.C. 1.

CANCER OF THE RECTUM

ITS PATHOLOGY, SYMPTOMATOLOGY AND TREATMENT.

BY W. ERNEST MILES, F.R.C.S., HON. F.A.C.S.,

Surgeon Emeritus (with beds) to the Cancer Hospital; Surgeon to the Gordon Hospital for Diseases of the Rectum, &c.

80 pp. and 33 plates, bound cloth. 7s. 6d. net, post free 7s. 10d.

"It is the best exposition of the subject with which we are acquainted."—BRITISH JOURNAL OF SURGERY.

Harrison & Sons Ltd., 44, St. Martin's Lane, London, W.C.2.

A NEW WORK—JUST ISSUED

MAZER & GOLDSTEIN'S

CLINICAL ENDOCRINOLOGY OF THE FEMALE

See Saunders' Advertisement on Page 3.

FIFTH EDITION. Pp. v+251. With Coloured Plate and 92 other Illustrations. Price 8s. 6d. Postage 6d.

REFRACTION OF THE EYE.

By ERNEST CLARKE, C.V.O., M.D., F.R.C.S.

The simplest book on Refraction, especially written for the General Practitioner.

"Can be recommended to the student as the very best on its subject."—BRITISH MEDICAL JOURNAL.

Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

OESOPHAGEAL OBSTRUCTION:

ITS PATHOLOGY, DIAGNOSIS AND TREATMENT

(including four chapters on Cancer of the Œsophagus).

By A. LAWRENCE ABEL, M.S. Lond., F.R.C.S. Eng.,

Assistant Surgeon to the Cancer Hospital, &c.

Pp. 245. 132 Illustrations. 2 Col. Plates. 30s. net.

"Masterful and complete . . . Cannot be too highly praised."
—SURG. GYN. AND OBSTET. JOUR.

Oxford University Press, Amen House, London, E.C.4.

THE CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS.

Vols. I and II. Price 10s. 6d. each. Postage extra.

"A guide to the interpretation and application of the more important methods of special investigation now in vogue."
—GLASGOW MED. JOUR.

"This work is of real practical value and we recommend it confidently."—MIDDLESEX HOSP. JOUR.

London: THE LANCET LTD., 7, Adam-street, Adelphi, W.C.2.

DISEASES OF THE THYROID GLAND.

WITH SPECIAL REFERENCE TO THYROTOXICOSIS.

By CECIL A. JOLL, M.S., B.Sc., F.R.C.S.(Eng.).

Crown 4to. Fully Illustrated. £3 3s. net.

"A work which is almost encyclopædic in its content, and is in every way a most remarkable achievement."—BRIT. MED. JNL.

"This splendid monograph, which is obviously the outcome of many years' work by the author, must long remain the source of reference on the subject."—PRACTITIONER.

William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

IMPORTANT ANNOUNCEMENT

A NEW BOOK

61 Illustrations. 21s.

MEDICINE

ESSENTIALS FOR PRACTITIONERS AND STUDENTS

By G. E. BEAUMONT, D.M., F.R.C.P., D.P.H., Physician, with Charge of Out-patients, Middlesex Hospital.

Author (with Prof. E. C. Dodds, M.V.O.) of "Recent Advances in Medicine," of which six editions have been published in eight years.

NEW FOURTH EDITION

752 Illustrations. 2 Vols. 28s.

SURGERY

THE SCIENCE AND PRACTICE

By W. H. C. ROMANIS, M.B., F.R.C.S., and PHILIP H. MITCHINER, M.D., F.R.C.S., Surgeons, St. Thomas's Hospital.

Four Editions of this famous book have been issued in five years. This new edition has been thoroughly revised and new illustrations added.

London: J. & A. CHURCHILL, 40 Gloucester Place, Portman Square, W.1

To Physicians treating

ASTHMA

a supply of—

Felsol

for clinical test sent on request.

'FELSOL' is a colourless crystalline powder of acid reaction, and somewhat bitter but not unpleasant taste. Easily administered by placing on the tongue and swallowing with a little water.

'FELSOL' contains no morphia or other narcotics.

'FELSOL' is equally efficacious in Angina pectoris and Dyspnoea in Phthisis.

Telephone: Museum 2855.

BRITISH FELSOL COMPANY LTD.,
15, Caroline Street, London, W.C.1.

Telegrams Felsol, Westcent, London.

VALENTINE'S MEAT-JUICE

In **Epidemic** and other **Diseases** of the **Tropics** in which there is great **Exhaustion,** excessive **Anaemia** and extreme **Irritability** of the **Digestive Organs, Valentine's Meat-Juice** demonstrates its **Ease of Assimilation** and **Power** in **Restoring** and **Strengthening.**

Albert Wilberforce Shepherd, *Glamorgan, Wales, Late District Medical Officer, Assam, India:* "I have used VALENTINE'S MEAT-JUICE in Assam, India, both in cases of Cholera and Dysentery and found it most efficacious; and in Wales, both during and after an attack of severe Influenza. I have found that in the former the stomach retained the preparation when all other things failed, and that in the latter, my patients had far less of the weakness usually complained of."

W. B. Scranton, M. D., *Medical Supt. Korean Mission Methodist Episcopal Church, Seoul, Korea:* "A most excellent use I frequently put VALENTINE'S MEAT-JUICE to, is tiding Babies through Cholera Morbus and Inanition. It acts at once and many a crisis has been passed safely, through the agency of VALENTINE'S MEAT-JUICE. It has also been of great value in my practice in the Far East in the treatment of that form of Summer Diarrhoea known as Sprue, where it tides the patients over until they can get to a better climate and the change of climate rectifies the rest."

For sale by all Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY
Richmond, Virginia, U. S. A.

A-35

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 5688 LONDON, SATURDAY, SEPTEMBER 3, 1932 CCXXIII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

The Surgery of the Posterior Cranial Fossa. By DONALD ARMOUR, F.R.C.S.—(*Illustrated*)—(*To be concluded*) 499

Cinchophen Poisoning. By T. G. REAH, M.R.C.P... 504

The Therapeutic Application of Gonadotropic Hormones. By Prof. R. W. JOHNSTONE, M.D., B. P. WIESNER, Ph.D., and P. G. MARSHALL, B.Sc. 509

Bacilluria under Ketogenic Treatment. By ANSON L. CLARK, M.D. 511

CLINICAL AND LABORATORY NOTES

A Simple Apparatus for Venesection. By Prof. C. C. OKELL, F.R.C.P., and P. D'ARCY HART, M.R.C.P.—(*Illustrated*).. 514

A Case of Narcolepsy. By E. MILDRED CREAK, M.R.C.P. 514

REVIEWS AND NOTICES OF BOOKS

Adulteration and Analysis of Foods and Drugs. Birmingham Methods and Analyses of Samples; Review of British Prosecutions during Half a Century. By J. F. Liverseege, F.I.C. 522

A Short Practice of Surgery. By Hamilton Bailey, F.R.C.S., and R. J. McNeill Love, F.R.C.S. . 523

Pulmonary Tuberculosis. By Maurice Fishberg, M.D. 523

A Thousand Marriages. By R. L. Dickinson, M.D., and L. Bean 523

An Introduction to Dermatology. By Prof. R. L. Sutton, Sc.D., and R. L. Sutton, Junr., M.D. 524

Die Quarzlampe und ihre medizinische Anwendung. By Dr. Erich Willisch .. 524

Cancer: Civilisation: Degeneration. By John Cope 524

LEADING ARTICLES

SEX HORMONE THERAPY.. 525

THE POLICY OF NATIONAL INSURANCE 525

THE DIETETIC TREATMENT OF URINARY INFECTIONS 526

ANNOTATIONS

An Association of Anæsthetists 527

Unexplained Gastric Hæmorrhage 527

Georg Schmorl 528

The Blood Groups in Law 528

Sky-Shouting 529

Phrenicectomy in Bronchiectasis 529

Radiography of Liver and Spleen 530

Health Organisation at Geneva 530

Nervous Disease following Small-pox and Vaccination 530

The Poisonous Yew..... 531

The Relief of Pain in Aneurysm..... 531

Malaria in Monkeys 532

Lead and the Nervous System 532

PANEL AND CONTRACT PRACTICE

Scottish Sickness Statistics.—A Pension and Insurance Scheme.—New Statutory Rules 537

THE SERVICES

Royal Naval Medical Service.—Royal Army Medical Corps.—Indian Medical Service..... 538

REPORTS AND ANALYSES

Strawberry Jam 524

SPECIAL ARTICLES

Mental Health in 1931: Report of the Board of Control.—(*Continued*)... 533

Medicine and the Law: Accident Within the Meaning of the Act.—Mental Patients Die from Eating Yew Leaves ... 534

Ireland: Department of Justice and the Hospital Sweepstakes.—Medical Registration of the Irish Free State 536

United States of America: Venereal Disease in San Francisco.—The Economic Depression .. 536

BRITISH MEDICAL ASSOCIATION

Centenary Meeting in London:

Section of Surgery: Removal of the Spleen.. 516

Sections of Pathology and Bacteriology: Tissue Changes in Virus Infections.—Cancer and Tuberculosis..... 517

Section of Pharmacology: Serum Treatment of Pneumonia.—Mechanism of Salivary Secretion ... 519

Section of Mental Disorder: Mental Health in Relation to Education.. 520

CORRESPONDENCE

The Increase in Arsenic-Resistant Syphilis (Dr. E. Tytler Burke)..... 539

Association of Anæsthetists of Great Britain and Ireland (Dr. H. W. Featherstone) 539

Prophylactic Plasmoquine on a Tea Estate (Sir Malcolm Watson) 540

Pyrexia in General Paralysis of the Insane (Drs. P. K. McCowan and M. L. M. Northcote) 541

The Natural Enemies of the Bed-Bug (Dr. C. Killick Millard)..... 541

Pyretic Treatment in Cases with Hypopiesis (Dr. H. W. Hales) 542

The Anæmias of Pregnancy (Dr. Lionel Whitby).... 542

The Biology of Tumour Formation (Mr. H. M. Woodcock) 542

PUBLIC HEALTH SERVICES

A Year's Work in a Scottish Tuberculosis Colony.... 543

Port Sanitary Authorities: Port of Liverpool.—Tyne 543

Infectious Disease in England and Wales ... 544

OBITUARY

Gustave Monod, F.R.C.P. . 544

George Kendall, M.R.C.S. . 544

MEDICAL NEWS

Society of Apothecaries of London 545

Fellowship of Medicine and Post-Graduate Medical Association..... 513

Welsh Hospitals 513

Holme Valley Hospital Maternity Ward 524

A Trade-union Convalescent Home..... 538

Empire Dental Convention 545

American Congress of Physical Therapy 545

NOTES, COMMENTS, AND ABSTRACTS

The Nightmare: Medical, Theological, and Popular Views: Ætiology.—Correlation between Fear and Sex.—The Nightmare in the Middle Ages. By ERNEST JONES, M.D. 546

Pyretic Treatment of G.P.I. 549

Cerebral Hæmorrhage in Whooping-cough 550

The African Native: His Unfitness 550

Malayan Medical Service . 550

Medical Diary 545

Vacancies 545

Appointments 550

Births, Marriages, Deaths . 550

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED

(FOUNDED 1892)

President: Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S.

Trustees for the Reserve Fund:
Rt. Hon. LORD DAWSON, P.C., G.C.V.O., K.C.B., M.D., P.R.C.P. Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S. Sir SQUIRE SPRIGGE, M.D., F.R.C.P., F.R.C.S.

The Society was founded for the following purposes: To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in regard to actions, etc., undertaken on their behalf.

The Society is fully insured to an unlimited extent against all adverse costs and damages which may be awarded against Members in any action which the Society undertakes on their behalf.

Annual Subscription: £1. Entrance Fee: 10s. Assets exceed £52,000.

No entrance fee to those joining within 12 months of registration.

Application form, and full particulars, from the Secretary, Victory House, Leicester Square, W.C.2.

Telephone: GERRARD 4814.

OXFORD MEDICAL PUBLICATIONS

LABORATORY SERVICE AND THE GENERAL PRACTITIONER

An Interpretation of Pathological Aids to Diagnosis.

By **ARNOLD RENSHAW**, M.D., B.S.(Lond.), D.P.H.(Manch. and Camb.),
Director of the Laboratory of Applied Pathology and Preventive Medicine, Manchester; Hon. Pathologist, Ancoats Hospital, Manchester; Bacteriologist, Royal Eye Hospital, Manchester.
With an Introduction by **DAN McKENZIE**, M.D.(Glas.), F.R.C.S.E.

Contents include:—Introduction—Examination of the Mouth and Respiratory Tract—Examination of the Stomach Contents—Examination of the Fæces or Intestinal Contents—Examination of the Urine—Investigation of Renal Efficiency—Examination of the Cerebro-spinal Fluid—Investigation of Liver Efficiency—Investigation of Pancreatic Efficiency—Indications for, and Interpretation of, Blood Counts—Biochemical Examination of the Blood—Examination of Milk—Collection of Pus: Administration of Vaccines: Antiseptics—Examination for Venereal Disease—Investigation of a Tumour—Investigation of a Pyrexia—Investigation of a Chronic Toxæmia—Skin Reactions—The Eye—Spectroscopic Examinations—Assessment of Insulin Dosage in a Diabetic—Appendix—Bibliography—Index.

Pp. 279. 8 Illustrations. **10s. 6d. net.**

INDIVIDUALITY OF THE BLOOD

IN BIOLOGY AND IN CLINICAL AND FORENSIC MEDICINE.

By **Professor LEONE LATTES**, Director of the Institute of Forensic Medicine in the University of Modena.
Translated by **L. W. HOWARD BERTIE**, M.A., B.M., B.Ch. (Oxon.).
From the French Edition of 1929, thoroughly revised and brought up to date by the Author.

Contents include:—"Constitution" and "Condition" in Relation to the Blood—Specific and Individual Factors in the Constitution of the Blood—Individual Immunity-reactions in Animals and in Man—Individual Reactions of Normal Blood (General remarks on Iso-agglutination, Blood-groups in Man, &c.)—The Hereditability of the Individuality of the Blood—The Individuality of the Blood as an Ethno-Anthropological Fact—The Individuality of the Blood in its Clinical Applications (Blood-transfusion, Incompatibility, &c.)—The Individuality of the Blood in Forensic Medicine (Affiliation Cases, Individual Diagnosis of Blood-stains, &c.)—Technique of the Individuality Reactions—Bibliography and Index to Authors—Index.

Pp. 427. 71 Illustrations. **30s. net.**

A New (Ninth) Edition of

MANUAL OF BACTERIOLOGY

By **ROBERT MUIR**, M.A., M.D., Sc.D., LL.D., F.R.S., Professor of Pathology, University of Glasgow; and the late **JAMES RITCHIE**, M.A., M.D., F.R.C.P. (Edin.).
Revised by **CARL H. BROWNING**, M.D., D.P.H., F.R.S., Gardiner Professor of Bacteriology, University of Glasgow; and **THOMAS J. MACKIE**, M.D., D.P.H., Irvine Professor of Bacteriology, University of Edinburgh.

Contents include:—General Morphology and Biology—Methods of Cultivation of Bacteria—Microscopic Methods—Examination of Serum, Preparation of Vaccines, Inoculation of Animals, Methods of Obtaining Bacteriological Material for Examination—Relations of Bacteria to Disease—The Production of Toxins by Bacteria—Immunity—Inflammatory and Suppurative Conditions—Gonorrhœa and Soft Sore—Tuberculosis—Leprosy—Glanders, Melioidosis, and Rhinoscleroma—Actinomycosis and Allied Diseases—Anthrax—Typhoid Fever, Bacilli Allied to the Typhoid Bacillus—The Vibrio Choleræ and Allied Organisms—Diphtheria—Epidemic Influenza, Infectious Coryza, Whooping Cough (Pertussis)—Plague and Tularæmia—Malta Fever and Epizootic Abortion—Tetanus, Other Anaerobic Bacilli—Diseases due to Spirochætes—Rickettsia Infections—Filter-Passing Viruses—Protozoal Diseases—Pathogenic Fungi—The Bacteriology of Air, Soil, Water, Sewage, and Milk—Antiseptics.

Pp. 890. 212 Illustrations, 6 Coloured Plates. **20s. net.**

A New (Third) Edition of

A TEXT-BOOK OF MASSAGE AND REMEDIAL GYMNASTICS

By **L. L. DESPARD**, Member Chartered Society of Massage and Medical Gymnastics;
With two chapters contributed by **HESTER S. ANGOVE**, Member Chartered Society of Massage and Medical Gymnastics, Sister-in-Charge of the Massage Department, Guy's Hospital, London.

Contents include:—The Structures of the Body—Waste and Repair of the Tissues—The Skeleton—Articulations or Joints—The Muscular System—The Nervous System—The Vascular System—The Respiratory System—The Digestive System—The Urinary Organs and the Suprarenal Capsules—The Uterus and the Ovaries—The Influence of Massage upon the Nervous, Blood Vascular, Lymph Vascular, Respiratory, and Muscular Systems, upon Digestion and Elimination, upon Bone—Classification and Description of Massage Movements: Effleurage, Stroking, Friction, Kneading, Petrissage, Tapotement, and Vibration: their Physiological and Therapeutic Effects—Swedish Remedial Gymnastics—Tables of Swedish Remedial Gymnastics—Description of Massage—Sprains, Dislocations, Recent Fractures, Stiff Joints, Diseases of the Tendon Sheaths, and Non-Infective Bursitis—Re-education of Muscles—Paralysis—Deformities—Diseases of the Respiratory Organs—Diseases of the Cardio-Vascular System—Massage and Exercises for Abdominal Conditions—Constitutional Diseases—Functional Disorders of the Nervous System—Diseases of Obscure Origin—Lubricants, Fomentations, Bandages—Electrical Methods in Conjunction with Massage.

Pp. 498. 230 Illustrations (90 in Colour). **22s. 6d. net.**

Oxford University Press

HUMPHREY MILFORD, Amen House, Warwick Square, London, E.C.4
Telephone: CITY 2604. *Telegrams*: FROWDE, CENT., LONDON.

ADDRESSES AND ORIGINAL ARTICLES

THE SURGERY OF THE POSTERIOR CRANIAL FOSSA*

By Donald Armour, C.M.G., M.B. Toronto, F.R.C.S. Eng.

SURGEON TO THE NATIONAL HOSPITAL, QUEEN-SQUARE

The posterior cranial fossa is a region of great interest to the neurological surgeon because it is the site of so many different forms of neoplasm. Some of these are found exclusively in this area, whilst others show a marked predilection for it, even if at times they occur elsewhere in the brain.

As a result of the closer coöperation of the neurological surgeon and neuropathologist, we are enabled at the present time to predict with a certain amount of assurance what particular form of tumour will be found in any particular situation within the brain. This has been due to an increasing tendency to concentrate upon the behaviour and features of special tumours in special situations, as it has become increasingly evident that tumours of particular histological types have a favourite site in the brain, produce a characteristic set of symptoms, and have a similar life-history. Hence it can often be decided in advance what form of surgical effort should be made, either to remove the tumour or to palliate its effects.

ANATOMY OF THE FOSSA

The posterior is the deepest and largest of the three cranial fossæ, and is limited in front by a line leading backwards and outwards on either side from each posterior clinoid process along the superior border of the petrous part of the temporal bone, where externally and behind it joins the superior lip of the transverse groove, ending posteriorly in the middle line at the internal occipital protuberance. Attached along this line is the tentorium cerebelli, the process of dura mater which roofs in the posterior fossa. The floor of the fossa is formed in front by the petrous and mastoid portions of the temporal bone, between which are wedged the body of the sphenoid and the basilar portion of the occipital bone. The posterior inferior angle of the parietal bone enters into the outer wall of the fossa on either side. The floor is completed behind by the squama occipitalis, divided into two parts by the internal crest, to which is attached the falx cerebelli, a process of dura mater separating the two cerebellar hemispheres.

The posterior cranial fossa lodges the cerebellum, pons, and medulla. It communicates with the general cranial cavity by means of the incisura tentorii, a large oval opening bounded in front by the basilar groove and behind by the anterior free edge of the tentorium. It is continuous below with the vertebral canal through the foramen magnum, which is occupied by the lower end of the medulla and its meninges, the vertebral, the anterior, and posterior spinal arteries, and the spinal accessory nerve.

On each side of the foramen magnum, in a nearly vertical line from below upwards, are the anterior condyloid foramen transmitting the hypoglossal nerve; the jugular foramen transmitting the spinal accessory, the vagus and glosso-pharyngeal nerves, together with the inferior petrosal and lateral sinuses; and the internal auditory meatus transmitting the auditory and facial nerves with the pars intermedia, together with the auditory branch of the basilar artery.

The wall of the posterior cranial fossa on each side, where the petrous, basisphenoid, and pars lateralis of the occipital bone come together is in contact with the lateral surfaces of the pons and medulla, and is overlaid by the hemisphere of the cerebellum. This is the site referred to as the "angle" (cerebello-pontine angle), or the "lateral recess," and is traversed lateralward by the auditory, pars intermedia, and facial nerves on their way to the internal auditory meatus.

It will be apparent how greatly the non-distensible fibro-osseous boundaries of the posterior cranial fossa must influence the time of onset and rate of progress of the symptom-complex of the tumours occurring therein.†

The following Table gives a list of the tumours occurring in the posterior cranial fossa and their relation to the cerebellum:—

Posterior cranial fossa tumours.	Extra-cerebellar. Angle or lateral recess.	Acoustic tumour (8th nerve tumour).
		Neurofibroma (von Recklinghausen's disease).
		Meningioma (endothelioma, mesothelioma).
		Epidermoid (cholesteatoma, "pearly" tumour).
		Cisternal arachnoiditis (circumscribed serous arachnoiditis, meningitis serosa circumscripta).
	Cerebellar.	Medulloblastoma.
		Astrocytoma.
		Ependymoma (ependymoblastoma).
		Papilloma of choroid plexus.
		Epidermoid.
		Dermoid.
		Angiomatous malformation.
		Hæmangioblastoma (angioblastoma, angioreticuloma).
		Tuberculoma.
		Metastatic carcinoma (carcinomatosis of the meninges).
		Parasitic cyst. (*Cysticercus cellulosæ*, hydatid cyst).

Acoustic Tumours

Acoustic tumours arise on the vestibular division of the eighth cranial nerve, always distal to the plane of the porus acusticus. According to Alan Skinner, the position of their origin in the peripheral non-glial part of the nerve is dependent on peculiar factors in the embryological development of this nerve.

The tumours rise from the endoneurium of the nerve, the type cell of the tumour being the neurolemma sheath cell. The fibrous tissue of the tumour is in the nature of a tissue reaction, and is present in varying amounts, which results in two groups of tumours being distinguished. One group is composed of large lobulated growths, tough and fibrous when cut, and often cystic in places, which bleed freely. The second group consists of rather smaller tumours of softer consistency, whose cut surface resembles white brain matter. They are not as vascular as the first group.

From a series of analyses of verified tumours, neither sex shows any definite greater predisposition to them, nor is one side likely to be more often affected than the other. As to age, the greatest number appear to be found in the fifth decade. As they are usually slow-growing tumours, and the onset of their earliest symptoms pass unrecognised, it is impossible to state with any accuracy the age at which they

* Based on lectures given at the hospital.

† Although, strictly speaking, fluid encysted in the arachnoidal cisterns and in the lateral recess is not a neoplasm, yet as the condition may produce symptoms analogous to a tumour it is included here.

commence. But symptoms of an acoustic tumour seldom occur before the third decade. So that, as Cushing points out, when cerebellar symptoms appear in the first two decades of life, an intracerebellar tumour should be suspected, unless the patient is the subject of a generalised neurofibromatosis.

SYMPTOMS

The symptom-complex of acoustic tumours has a remarkable constancy in the chronological order of its component parts. Briefly, the order of progress is: involvement of the eighth nerve (cochlear or/and vestibular divisions); pain or discomfort in the suboccipital region; cerebellar incoördination and instability; involvement of adjacent cranial nerves, especially the seventh and fifth; evidence of increased intracranial tension due to hydrocephalus, as shown by headache, vomiting, and papillœdema.

With this order established, a clinical diagnosis of acoustic tumour can be made with reasonable certainty.

Tinnitus, of one form or other, usually precedes the onset of deafness. If the tumour does arise from the vestibular division of the nerve, as Henschen and Skinner believe, one would expect labyrinthine symptoms to antedate disturbances of hearing. And this is true in many cases. Further, cases of acoustic tumour have been reported in which the cochlear division of the nerve was intact, both functionally and anatomically. But from the history alone it is difficult to separate labyrinthine from cerebellar symptoms. And when the majority of patients come under observation, they are well past the stage of inaugural symptoms.

Soreness and stiffness of the neck, and paroxysmal pain, usually on the side of the lesion, and aggravated by coughing, sneezing, or straining, may be complained of. These suboccipital discomforts may become severe enough to give rise to a tilting of the head towards the homolateral shoulder.

In the course of time, usually about a year after the onset of acoustic symptoms, signs of cerebellar disorder make their appearance, due to pressure by the tumour on the cerebellum, with deformation and displacement of the affected hemisphere. Cerebellar incoördination, as shown by unsteadiness of gait, or even reeling, first appears. As Stewart and Holmes showed some years ago, the tendency in walking is to deviate to the side of the lesion, and also to fall to that side.

Nystagmus, whether of vestibular or cerebellar origin, is an early sign, and may antedate all other signs of cerebellar motor incoördination. It has been noted by many observers that the oscillations are slower with the eyes turned to the affected than to the unaffected side.

The cranial nerves adjacent to the affected eighth nerve vary in the time and the degree of their involvement. And the intensity of their disturbance tends to fluctuate from time to time. This is in strong contrast to the steady persistency of the auditory nerve symptoms. This disturbance is due to direct compression and distortion, and is most strikingly seen in connexion with the seventh and fifth nerves. The involvement of the seventh nerve is shown usually by slight weakness of facial movement. Adie has emphasised the fact that the first and only sign of involvement of this nerve may be absent or incomplete blinking on the side of the lesion, and this irrespective of whether the fifth nerve is also implicated or not. More rarely, twitching of the facial muscles occurs. Recently I saw, with Adie, a patient with a still rarer condition—viz., attacks of tonic facial spasm on the side of the lesion. These, with the facial paresis, disappeared completely after operation. Paræsthesias over the area supplied by the fifth nerve proclaim its involvement, which is further confirmed by a lowering or loss of the corneal reflex on that side. Though they are rare, examples of neurotropic keratitis have been reported in cases of acoustic tumours. It is well to remember, as Cushing emphasises, that this never occurs in true trigeminal neuralgia unless a section of the nerve has been performed.

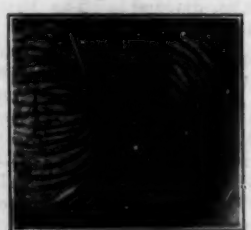
Should the fifth nerve be grossly involved, deviation of the jaw towards the affected side may be present, due to weakness or paralysis of the muscles of mastication supplied by its motor division. Loss of palatal reflex on the side of the lesion has been observed a number of times.

A history of double vision and an objective weakness of the abducens on the side of the lesion are fairly common. The fluctuating character of the diplopia and its disappearance after operation, lead Cushing to explain its presence as due, not to direct pressure on the sixth nerve—for it never comes into contact with the tumour—but to its strangulation by an overlying vessel. However, other explanations of such occurrences have been invoked by Collier, Wolff, Wernicke, and Walshe.

Only in very exceptional cases do the ninth, tenth, eleventh, and twelfth nerves play any part in the symptomatology of acoustic tumours. But that they may have at times a close relationship to the tumour as found at operation is well shown in Fig. 1. The clinical picture is too well-developed

FIG. 1A

FIG. 1B



1A, Author's case of eighth nerve tumour as seen at operation. The ninth, tenth, and eleventh nerves are seen crossing the lower pole of the tumour. 1B, Capsule opened and contents removed by diathermy and suction.

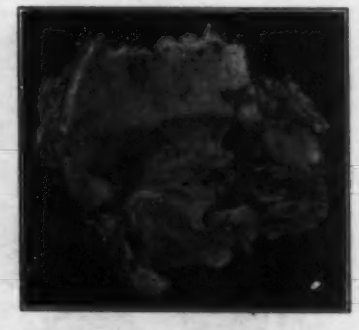
in other directions to need their involvement as an aid to diagnosis. A word of warning is necessary against the false localising signs produced in those cases where the contralateral cranial nerves are affected.

The general pressure symptoms—headache, nausea and vomiting, and papilloedema—are due to a hydrocephalus produced by distortion of the pons with blocking of the aqueduct of Sylvius. While they do not antedate the neighbourhood symptoms previously described, they are practically always present when the case comes to operation. Other results of the increase in the general intracranial pressure are absorption of the dorsum sellæ, cerebral herniations, and the so-called "pressure cone" at the foramen magnum, the tonsillar lobes of the cerebellum being squeezed down around the medulla even into the vertebral canal.

The fluctuation of symptoms has been referred to already, and is one of the notable features of these cases. This is true of nearly all the symptoms except those referable to the eighth nerve itself. Now the tumour is not only subdural and extracerebellar, but lies in a capsule of arachnoid, and is surrounded by a collection of fluid. In other words, it actually lies within a dilated lateral cistern. Hence, variations in the cerebro-spinal fluid circulation and alterations in the size of the cistern may well explain not only fluctuation of symptoms, but the fact that small tumours may produce marked general pressure disturbances.

Inasmuch as these tumours develop within the internal auditory meatus, and cause in some cases marked pressure absorption of bone (Fig. 2), one would imagine that such enlargement of the porus acusticus internus would be easily shown in stereoscopic radiograms. This, however, is unfortunately not so. I have been unable to find a single case at the National Hospital where the X rays have shown with any certainty an enlargement of the porus. In the radiograms of their patients with cerebello-pontine angle tumour, Heuer and Dandy were unable to recognise a unilateral enlargement of the internal auditory meatus. In Cushing's clinic, where an examination of verified acoustic tumours was made with this particular point in view, "it was disappointing to find in how few cases they were able to demonstrate any enlargement of the canal." However, it is probable that with the more recent improvements in X ray technique it will be possible to demonstrate such an enlargement when present.

FIG. 2



Pressure absorption of the porus internus by an eighth nerve tumour. (Museum, National Hospital.)

Summary.—The acoustic tumours arise from the endoneurium in the peripheral non-glial portion of the vestibular division of the eighth nerve within the auditory canal. They cause by pressure absorption an enlargement of the porus internus. From this point the tumour grows inwards throughout the nerve. The neighbouring structures in the cerebello-pontine angle suffer from the secondary effects of compression. Finally, there results an internal hydrocephalus with all the general pressure phenomena of an intracranial tumour.

BILATERAL ACOUSTIC TUMOURS

Though acoustic tumours are usually single, the occurrence of bilateral tumours is not uncommon. In 1915 Henschen collected 245 cases of unilateral acoustic tumours and 24 cases of bilateral ones. When bilateral, they are commonly, but not always, part of either a generalised or of a central neurofibromatosis. To what number multiplicity of tumours may reach is shown by two of the cases reported by Greenfield. One had bilateral acoustic tumours, a cortical brain tumour, a central tumour of the cord, and multiple neurofibromata of nerve-roots; the other, a tumour of the postero-internal border of the left occipital lobe, a tumour in each cerebello-pontine angle, a central tumour with cavity formation occupying the whole cervical cord, and almost all the anterior and posterior nerve-roots enlarged into fusiform swellings. All these tumours were of the same class and closely allied to the neurofibromata of von Recklinghausen's disease (Fig. 3).

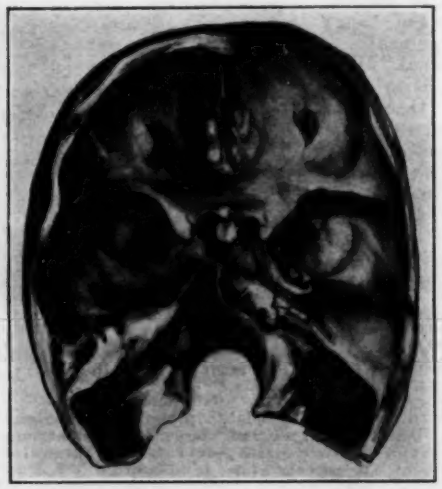
FIG. 3

Bilateral acoustic tumours (A), third nerve tumour (B), and a meningioma of the left cerebral hemisphere (C). (Museum, National Hospital.)

Out of 44 cases of bilateral acoustic tumours reported, 37 were associated with neurofibromatosis, while 7 were not. Gardner and Frazier are inclined to think that these figures indicate that unilateral and bilateral acoustic tumours are two separate and distinct disease entities. Penfield, on pathological grounds, supports this view. He states that the isolated unilateral tumours, which he calls "perineurial fibroblastomata," contain nerve-fibres only in the capsule. In the tumours of von Recklinghausen's disease, however, the nerve-fibres will be found to

penetrate the tumours with but few exceptions. Therefore, the tumours of this latter disease constitute the true neurofibromas. Greenfield and Cushing, however, disagreed with these conclusions, and were of opinion that the tumours showed the same

FIG. 4



Pressure absorption of bone from a neurofibroma of the fifth nerve. (Museum, National Hospital.)

histological characters whether they occurred as solitary tumours or as part of the more generalised disease. They thought that they arose from the cells of the neurilemma or sheath of Schwann, which develop originally from the neural crest. Masson, Roussy, and Skinner in recent publications also hold to the view that they arise from the sheath of Schwann, while Mallory and Penfield think that they are fibrous tissue tumours. Greenfield summarised the question thus:—

"In the light of the collected cases of multiple neurofibromatosis, either "central" or generalised, associated with tumours of the acoustic nerve, it must be considered that tumours of the acoustic nerve are closely akin to the peripheral nerve tumours of von Recklinghausen's disease, differing from them only in their greater tendency to the formation of glia-like areas, and in the absence or extreme scarcity of myelinated or bare nerve-fibres. In all probability the bundles of fibrous cells are similar in all these tumours and have a similar origin."

If Penfield is correct, it yet remains to be settled whether the perineurial fibroblastoma and the neurofibroma have the same seat of origin on the acoustic nerve.

Malignant degeneration of a neurofibroma, especially in tumours situated on nerve trunks, is fairly common. Adrian estimates the frequency as 1 in 12. Fig. 4 shows that they too may cause marked pressure absorption of bone. Here the inner end of the petrous bone has been destroyed by a neurofibroma of the fifth nerve. One half of the tumour lay in the posterior cranial fossa and the other in the middle fossa. The two halves of the tumour were united by a narrow isthmus, which passed through the opening in the dura mater, which was very little enlarged.

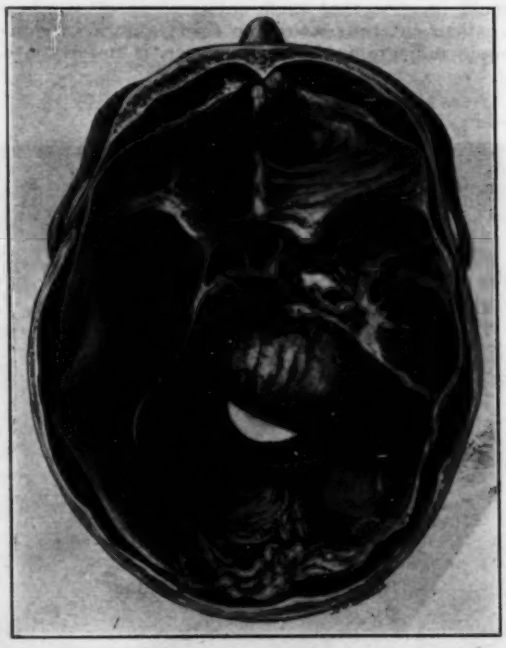
That the diagnosis of the presence of bilateral tumours is not always easy is shown by cases in which a single tumour has given rise to symptoms which one would expect to find with bilateral tumours. As already described, bilateral cranial nerve symptoms may be due to a single lesion, and the contralateral fifth and seventh nerve symptoms may be the more pronounced.

The eighth nerve lesion is far more important in localisation than all the other extracerebellar symptoms, and the diagnosis of a bilateral lesion should only be made in the presence of a bilateral involvement of that nerve. However, it is obvious from the figures already quoted that bilateral tumours should always be suspected in the presence of a generalised neurofibromatosis.

Multiple endotheliomata of the cerebral and spinal meninges are not uncommonly found with a central neurofibromatosis. This has led Cushing, following Verocay, to the conclusion that isolated acoustic tumours, generalised neurofibromatosis, and endotheliomata of the meninges are in some way correlated lesions, the underlying factor probably being some anomaly of development of the nervous system and its coverings.

Generalised neurofibromatosis has long been known as a familial disease. Recently Gardner and Frazier have reported a clinical study and field survey of a family of five generations, in which 38 members exhibited a particular expression of the disease, namely, bilateral acoustic neurofibromas, with, however, other manifestations of the disease almost entirely lacking. In their series of cases they point out that "the condition seems to follow the Mendelian principles with a remarkable degree of exactness."

FIG. 5



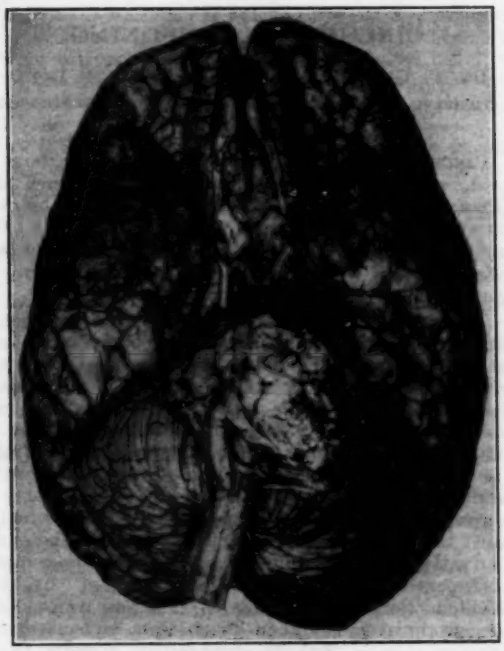
Meningioma in the right cerebello-pontine angle attached to the lower wall of the lateral sinus. (Museum, Royal College of Surgeons of England.)

Meningioma

In the records of the National Hospital for the past ten years, out of 97 intracranial meningiomas, 8 were found in the posterior cranial fossa (8·23 per cent.).

These subtentorial meningiomas usually arise from the lower wall of the transverse (lateral) sinus (Fig. 5), and are of all tumours in this region the most favourable for operative removal. Very rarely they may arise actually within the internal auditory meatus, in which case they give rise to exactly the same symptoms as a true acoustic tumour. But the

FIG. 6



Epidermoid in the left cerebello-pontine angle. (Museum, National Hospital.)

nerve is merely pressed aside, not actually incorporated in the growth. In their usual place of origin they give rise, like other recess tumours, to the symptoms usually associated with acoustic tumours, from which they can be diagnosed only by close attention to the chronology of their inaugural symptoms.

Epidermoids

The term in most general use for these tumours, "cholesteatoma," refers to a chemical by-product which is not always present. Neither does cholesterol play any part in their histology, and, moreover, it is present in many other forms of brain tumour. The name "epidermoid" is the one advocated by Critchley and Ferguson as being the most scientific one.

They are opaque, glistening, non-vascular tumours, the so-called "pearly" tumour of Cruveilhier, which have their chief seat of election in the subarachnoid cisterns. They are usually ovoid or spheroidal in shape with an irregularly lobulated surface, and vary in size according to their site and life-history. Their most characteristic feature, however, is the opaque, white, and glistening appearance of the capsule, which gave them their original name of "pearly" tumour. But it should be pointed out that this term refers only to the external appearance of the tumour as seen on first exposure, tending to disappear in museum specimens. It gives no clue to the histological structure of the tumour, and should also be abandoned as unscientific.

When found in the posterior cranial fossa they may occupy the whole of the lateral recess, in close association with the course of the fifth, seventh, and eighth nerves. The one shown in Fig. 6 had grown into the internal auditory meatus and had flattened out the eighth nerve and to a less extent the fifth nerve. It covered the lateral and ventral surfaces of the pons and its right border passed under the basilar artery. Or they appear in the midline on the ventral aspect of the cerebellum, originating apparently at a point within the fourth ventricle. Unless growing within the substance of the brain, they do not infiltrate it, but are sharply demarcated from it, giving rise, according to their size, to a varying degree of pressure. In most cases a definite point of attachment to the pia-arachnoid can be demonstrated.

Critchley and Ferguson favour the view that these tumours are essentially and primarily epithelial and that they arise from the overgrowth of epithelial rudiments. Histologically epidermoids and dermoids resemble one another, and these authors think that there cannot be logically any strict or sharp line of demarcation between them. Both are primarily epithelial tumours resulting from cell inclusions. But it should be pointed out that while the epidermoid consists only of ectodermal derivatives, dermoids are characterised by ectodermal epidermis plus mesodermal corium with its connective tissue, fat cells, sebaceous gland, and hair follicles. In other words, the epidermoid anlage consists of epidermal cells, ectodermal in origin, while the dermoid anlage consists of a dermal cell complex, both ectodermal and mesodermal in origin. According to Bostroem, the tissue depth of the anlage and the age of the embryonic layer determine whether a dermoid or an epidermoid will result.

The following classification of epidermoids, dermoids, and teratomata is taken from the article by Brock and Klenke :—

I. Epidermoids: 1. Pial or meningeal. 2. Diploic. 3. Extracranial. 4. Combined (1 and 3) and communicating.
II. Dermoids: 1. Pial. 2. Dural (extra and intra). 3. Extracranial. 4. Combined (2 and 3) and communicating.
III. Teratomata: 1. Solid: embryoidoma (*teratoid*, teratoblastoma—contain fœtal tissues—not organs). 2. Cystic: embryoma (*teratoma*—contain fœtal tissues and organs).

With the epidermoids the male sex predominates and the majority appear in the third and fourth decades. They are slowly growing tumours and the symptoms are usually of long duration.

From a careful examination of their own cases and those recorded by others, Critchley and Ferguson were unable to find any pre-operative features, signs, or symptoms, which are peculiar to epidermoids. The clinical symptoms depend solely upon the site of the tumour, the nature of which is only revealed at operation or autopsy.

Reference should be made to the occurrence, frequently noted, of a localised "meningitis" following an attempt to remove them at operation. This would appear to be of the nature of an irritation of the meninges set up locally by toxic material contained in these tumours. Hence the necessity for scrupulous care in their removal to prevent contamination of the surrounding area should the capsule be ruptured in the operation for their removal.

Cisternal Arachnoiditis

Chronic arachnoiditis appears to be a fairly widespread disease, though the local symptoms produced

by it may be referred to the posterior fossa, the chiasmal region, or a certain level in the spinal cord. As I have pointed out elsewhere:

> "It is not difficult to imagine that, in a more or less mild diffuse condition, the brunt of the reaction may have fallen upon one particular section of the arachnoid more than another, giving rise to a circumscribed lesion, more severe than elsewhere and the only one to make its presence known clinically."

As Heuer and Vail have pointed out, "localised arachnoiditis is identified by symptomatology rather than by pathology."

The ætiological factor in its production is either trauma or an antecedent infection. Syphilis or tuberculosis plays no part in the ætiology of these cases, but, as usual, a previous attack of influenza has been invoked as the cause. Some of the cases come on with sufficient abruptness to be labelled acute or subacute; while others are gradual in onset and merit the term chronic. De Martel says that the onset of symptoms is often marked by a "pseudo-meningitic" period of short duration followed by an apparent recovery. There follow, however, transient increases of tension in the posterior fossa, which affect chiefly the cochlear nerve and the cerebello-vestibular apparatus.

As long ago as 1894 Oppenheim stated, "we cannot too strongly emphasise the fact that serous meningitis may produce symptoms absolutely identical with those of brain tumour." In 33 cases reported by Horrax, where the process affected the posterior cranial fossa, all presented general pressure symptoms, with well-marked papillœdema in most of them. While the cerebellar symptomatology was not pronounced, the majority showed nystagmus, moderate ataxia, incoördination of the upper limbs, unsteadiness of gait, and rombergism; while in some instances there was involvement of the fifth, seventh, or eighth cranial nerve. In certain cases the clinical aspect is that typical of a midline tumour, especially if the cerebellar tonsils are herniated through the foramen magnum. De Martel and Guillaume, on the other hand, think that the symptoms are usually very ill-defined but that the variable character of their localisation and intensity are absolutely characteristic. According to these authors, the ophthalmological signs are an early swelling of the discs, developing by successive stages, and accompanied by a sudden diminution of visual acuity, which is nevertheless quickly recovered from.

The pathological condition consists of a thickened and opaque arachnoid membrane, grey or bluish-violet in colour, containing pent-up cerebro-spinal fluid under pressure. An examination of portions of the membrane removed at operation reveals a chronic inflammatory thickening without any indication of the causative factor. The basilar cisterns and the large posterior cistern over the cerebellum are chiefly affected.

Similar circumscribed collections of cerebro-spinal fluid may occur in the cerebello-pontine angle, and simulate true "recess" tumours. Some of these cases are associated with an infective process arising from an otitis media, whilst others have, like the generalised form, an obscure ætiology. When a sequel to an otitis media, which has damaged hearing, the differential diagnosis from a true acoustic tumour may be extremely difficult. Added to this is the fluctuation of symptoms seen in both conditions and due probably to the same cause. Unfortunately, a lumbar puncture, which may, by the alleviation of its symptoms, point to a chronic local serous meningitis, is associated with grave danger in the presence of a true recess tumour.

The overlying arachnoid cyst, which so often must be evacuated to bring an acoustic tumour into view, must not be confused with the simpler condition. Only complete exposure of a normal nerve with the porus internus intact permits of a diagnosis of chronic serous arachnoiditis.

(To be concluded.)

CINCHOPHEN POISONING

By T. G. Reah, M.B. Camb., M.R.C.P. Lond.

LATE HOUSE PHYSICIAN TO THE MEDICAL UNIT, LONDON HOSPITAL

Cinchophen, or 2-phenyl-quinoline-4-carboxylic acid, was first described in 1887 by Döbner and Giesecke.[1] In 1908 Nicolaier and Dohrn[2] observed its effects on the excretion of uric acid, and in 1911, under the proprietary name of Atophan, it was introduced as a drug of value in the treatment of gout.

The drug is also known by its synonyms phenyl-cinchoninic acid, phenyl chinolincarbonic acid,[3] and as the proprietary preparations Agotan, Phenoquin, and Quinophan. A neutral solution of the sodium salt of cinchophen and sodium salicylate has been used for intravenous injection under the name of Atophanyl. Neocinchophen (syn. novatophan, tolysin) the ethyl ester of methyl-phenyl-quinoline-carboxylic acid and oxyl-iodide, which consists of two parts of cinchophen in chemical union with one part of iodine and three parts of uncombined cinchophen are derivatives of cinchophen which have been used therapeutically. Weldona, manufactured by the Weldona Corporation, America, is a preparation said to contain neocinchophen, magnesium carbonate, and cascara sagrada, but its composition appears to be very variable.[4] Atoquinol,[5] allyl-phenyl-cinchonin-ester is not strictly a derivative of cinchophen. Diiodoatophan, which contains 50·7 per cent. of iodine, has been used for cholecystography.

In this paper it is proposed only to consider those cases where toxic effects have followed the use of cinchophen, although cases have been reported following the administration of neocinchophen,[6] atophanyl,[7] [8] [9] oxyl-iodide,[10] di-iodo-atophan,[11] atoquinol,[12] Weldona,[13] [14] and a patent medicine[15] whose composition was not stated.

The quinoline nucleus is common to all the drugs of this group, and it has been suggested by Willcox[16] that in those cases of poisoning where there is a toxic jaundice, the toxic action is due to the presence of this nucleus.

Nicolaier and Dohrn[2] showed that the administration of cinchophen caused a great increase in the output of uric acid in the urine of healthy persons, and an even greater increase in those suffering from gout. This increase is found to appear about two hours after the administration of the drug and, according to Graham,[13] persists for two to three days then falling to normal in spite of the continued ingestion of the drug. The increased excretion of uric acid is accompanied by a fall in the uric acid content of the blood, but the mode of action of cinchophen in producing these effects is doubtful.

After 1908 cinchophen came to be used extensively in the treatment of gout and, to a less extent, in rheumatic fever, the other forms of arthritis, sciatica,

lumbago, and neuralgia, and evidence was soon forthcoming of its beneficial effect.[17] [18]

Toxic Effects of Cinchophen

It was quickly realised that the use of cinchophen was not infrequently accompanied by toxic phenomena. The first reference to any intolerance that I have found is by Woodwark in 1912,[17] two of whose cases complained of gastric pain, but Woodwark considered that the drug showed no ill-effects except in the presence of gastritis and, probably, nephritis.

In 1913 Phillips[19] described five cases of skin eruptions following the use of cinchophen; of these, three were urticarial, one purpuric, and one scarlatiniform. In one case the rash appeared after only two doses of grs. 7½ and in three cases the rash recurred on further administration of the drug.

Phillips quotes two further cases in one of which the eruption was scarlatiniform and in the other urticarial.

Shortly afterwards Herrick[20] reported a case in which a scarlatiniform rash was associated with a rise of temperature. There were no other signs of scarlet fever and the rash cleared up on cessation of the drug. Marañon[21] records two cases; in the first patient symptoms of an acute intoxication with chills, fever, and a red rash resembling erysipelas of the head and neck developed. These symptoms recurred when, sometime later, the patient again took cinchophen. The second case showed after one tablet of cinchophen a syndrome similar to the above but with no rash. There was also intense pruritus, and again the symptoms recurred a few weeks later when one tablet of the drug was taken.

In 1921 Hanzlik, Scott, Weidenthal, and Fetterman[22] using large doses, investigated the effects of cinchophen in acute rheumatism and other conditions. They found that 11 out of 17 patients complained of one or more of the following symptoms: headache, dizziness, buzzing in the ears, nausea and sometimes vomiting, and epigastric pains. They also investigated the renal function of seven cases and found albuminuria present in five with occasional casts and white blood-cells. Also, of the seven cases, five showed a diminished excretion of phenol-sulphonephthalein.

Schroeder[23] in 1922 stated that he found cinchophen of great value but that he regarded it as a dangerous drug. He recorded 17 cases of poisoning following its use, the most prominent symptoms being urticarial eruptions, with or without œdema, albuminuria, fever, headache, general malaise, gastro-intestinal disturbance, and in two instances cardiac symptoms.

The first case of jaundice following the administration of cinchophen was reported by Worster-Drought[24] in 1923. A man, aged 59, after taking cinchophen grs. 7½ three times daily for 12 days developed an urticarial rash. He ceased to take the drug, but three weeks later took one dose of grs. 7½. The urticaria reappeared along with severe pruritus, and ten days later moderate jaundice supervened which persisted for several weeks.

Since 1923 there have been many cases reported of jaundice following the use of cinchophen, of which a number have ended fatally.

REPORTED CASES OF JAUNDICE

A woman,[25] aged 63, took cinchophen grs. 7½ three times daily. After three months she began to vomit but continued to take the drug. She became jaundiced, comatose, and died. At autopsy the liver showed the changes of yellow atrophy.

Willcox[16] mentions that he has seen three cases of toxic jaundice, one case that of a man, aged 69, proving fatal. The man had taken cinchophen grs. 5 three times daily for one week, and sodium bicarbonate half a drachm twice daily. There was no autopsy.

Evans[26] cites three cases of severe poisoning going on to the development of jaundice, all the patients recovering. These cases were in no instance the result of taking large doses. Thus, one of his patients who developed symptoms on two separate occasions took on one of these at most two half-gramme tablets.

A man,[27] aged 54, a publican, took cinchophen for a long period. Jaundice developed and a laparotomy was performed, death occurring two days later. At autopsy the liver was found to be cirrhotic and atrophied. Sections showed slight periportal fibrosis and small cell infiltration around Glisson's capsules—probably of some standing and a relic of a previous inflammatory process.

A man,[28] aged 33, after taking cinchophen for five months suffered from nausea, loss of weight, and jaundice. He recovered.

A man,[29] aged 39, took 25 tablets of cinchophen and then suffered from nausea, loss of weight, and jaundice ultimately recovering.

A man,[30] aged 47, took cinchophen and died of acute yellow atrophy of the liver. Details are not given.

A woman,[30] aged 55, took cinchophen grs. 7½ three times daily for six months and then developed jaundice which progressed, the patient ultimately dying. At autopsy acute yellow atrophy of the liver was found, sections of the organ showing multilobular fibrosis probably antedating the acute yellow atrophy.

A woman,[30] aged 53, took cinchophen grs. 7½ three times daily for three days each week and one drachm of sodium bicarbonate once daily for about seven weeks. About a fortnight later jaundice occurred and a laparotomy was performed as the diagnosis was uncertain. Death followed, and at autopsy a small liver typical of acute yellow atrophy was found.

A woman,[31] aged 27, after taking at least 75 tablets of cinchophen, developed jaundice, nausea, vomiting, constipation, and later ascites. A mercurial preparation was given intravenously, but the urinary output fell considerably. Following paracentesis of the abdomen a Talma-Narath operation was performed, but death occurred. At autopsy the liver showed fatty infiltration, degeneration, and necrosis, and in the kidneys were signs of nephritis.

A woman,[32] aged 65, took 60 g. cinchophen in four weeks. She became jaundiced, finally recovering.

A man,[18] aged 53, a brewer's drayman, was given cinchophen grs. 7½ three times daily for four days a week. Five weeks later he complained of lassitude, anorexia, vomiting, and drowsiness by day with insomnia at night. One week later he ceased to take the drug and another week later became jaundiced. On examination he was found to be deeply jaundiced with a scaly papular rash over his chest and back. He recovered slowly.

A woman,[33] aged 37, following a pregnancy 12 months previously, took an unknown amount of cinchophen. She complained of nausea and pruritus and two weeks later became jaundiced, but rapidly improved, the jaundice disappearing. Eight weeks later the nausea, vomiting, jaundice, and pruritus recurred with an erythematous eruption. Death occurred, and at autopsy the liver showed signs of acute yellow atrophy, weighing 1045 g.

A woman,[34] aged 46, in a period of about two years, took grs. 7000 cinchophen. She then complained of epigastric pain, and bile appeared in the urine. Death occurred, and at autopsy the liver weighed 575 g., showing a toxic cirrhosis.

A woman,[35] aged 29, was given cinchophen and sodium salicylate for 20 days. She then became jaundiced but ultimately recovered. The same author also quotes a similar case which recovered, but gives no details.

A man,[36] aged 47, after taking cinchophen for six weeks, became jaundiced with some pruritus and purpuric spots. He recovered.

A man,[37] aged 54, took cinchophen for nine days and then developed an urticarial eruption. Although he was not jaundiced his plasma gave delayed direct and positive indirect van den Bergh reactions. Recovery took place.

A woman,[37] aged 52, in 1922 had radium applied to a squamous cell epithelioma of the cervix of the uterus and in 1928 was alive and well. In 1929 she took 1 to 3 tablets of cinchophen daily for pain over the right sciatic nerve. After one month she complained of nausea and vomiting, and a week later became jaundiced. She was given a high carbohydrate diet, calcium lactate by the mouth, and calcium chloride[38] and glucose intravenously. She died. At autopsy evidence of malignancy was found in the right ovary but not in the uterus. The liver showed the changes of acute yellow atrophy and weighed 903 g.

A woman,[39] aged 37, took cinchophen grs. 2 three times daily on and off for two months. She then became tired

and languid and later jaundiced. She recovered after an illness lasting for two months.

A woman,[39] aged 31, after taking 20 cinchophen tablets, developed weakness followed by jaundice and slight glycosuria. The fasting blood-sugar was 0·10 per cent. She was found to be pregnant and a therapeutic abortion was performed. She recovered in seven weeks.

A man,[39] aged 45, took cinchophen grs. 7½ three times daily for four months, and this dose was then increased to grs. 7½ every three hours. On six occasions he was also given protein shock. Nine days after the dose of cinchophen had been increased he became very weak and unconscious, with deep jaundice and ascites. He died, and at autopsy the liver weighed 1100 g., showed pericapsular adhesions, and on section revealed nodular hyperplasia with portal cirrhosis.

A woman,[39] aged 51, was put on cinchophen grs. 5 (three times daily ?). After four weeks she had severe epigastric pain with deep jaundice. She died, and at autopsy subacute yellow atrophy of the liver was found.

A patient[39] (sex not stated), aged 26, suffering with polyarthritis had fever, an enlarged spleen, and generalised enlargement of the lymph glands. After receiving about grs. 70 cinchophen, tonsillectomy was performed. This was followed by sudden jaundice, and the patient died ten days later.

A woman,[39] aged 39, treated with large doses of cinchophen for six months, developed progressive jaundice. A laparotomy was performed and the patient died on the table. A very small cirrhotic atrophic liver was found.

A man,[13] aged 60, was given cinchophen grs. 45 daily for four days a week during a period of two and a half months. He became jaundiced and died. At autopsy acute yellow atrophy of the liver was found.

A woman,[14] aged 40, in six months took 13 boxes of cinchophen. She became jaundiced and a maculo-papular eruption appeared over the face and chest. The Wassermann reaction was positive. Anasarca developed, followed by death. At autopsy the liver weighed 735 g. and showed the appearances of acute yellow atrophy.

OTHER MANIFESTATIONS OF CINCHOPHEN POISONING

A man,[40] aged 48, formerly in the liquor business, had one dose of grs. 7½ cinchophen. He complained of feeling hot all over, nausea, palpitation, and collapsed, being pale and cold. His systolic blood pressure was 65 mm. and his diastolic 42 mm. He quickly recovered, but 12 hours later had a similar slight attack. Two years previously he had had two similar attacks following single doses of cinchophen.

A man,[41] aged 44, took grs. 15 cinchophen five to six times daily on and off for three to four years. Then he collapsed for half an hour but did not lose consciousness. Three months later, after taking two tablets, he again collapsed being cyanosed with a systolic blood pressure of 75 mm. His face, arms, and chest turned bright pink. In his urine were found albumin, a few red blood corpuscles and casts. Again he quickly recovered.

A man,[18] aged 62, took cinchophen 6 g. a week for a period and then the dose was reduced to 5 g.; sodium bicarbonate was also prescribed. Nearly three years later he complained of loss of weight, dizziness, occasional palpitation, and a feeling as if his legs were giving way as he walked. The cinchophen was stopped and his symptoms rapidly subsided.

A woman,[18] aged 66, suffered from gastric distress and severe malaise lasting for three hours on repeated occasions following one tablet of cinchophen.

A woman,[18] aged 43, suffering from gout, was given cinchophen, but it was found that doses greater than 0·06 g. caused an exacerbation of her joint condition with a rise of temperature.

A man,[13] aged 66, who had suffered from gout for many years, found that cinchophen brought on attacks of acute gout.

Petty [42] reports the case of a man who developed a very acute neuralgia in the region of his left shoulder and arm. He was given atophan and took 10 pastilles in one day. A few days later he complained of pain in the pit of his stomach. He rapidly became worse and a laparotomy was performed, when fat necroses and hæmorrhages in the pancreas were found. The liver appeared to be normal. A few days later the patient had a large hæmatemesis. He then made a slow uninterrupted recovery. Whether the acute pancreatitis found in this patient can be regarded as being due to the cinchophen is doubtful.

Three Unreported Cases

I have found in the records of the London Hospital particulars of three patients suffering from cinchophen poisoning. None of these cases has previously been reported.

CASE 1.—A woman, aged 64, of no occupation, first attended the out-patient department of the hospital on August 28th, 1928, complaining that for six years she had suffered from pains in various joints. On examination, the heart, lungs, and abdomen showed no abnormalities, but there was great deformity of the hands, knees, and ankles, with crepitus on movements of the latter two joints. The urine contained no albumin, sugar, or bile. A diagnosis of rheumatoid arthritis was made, and she was given a mixture containing sodium salicylate, and also radiant heat baths.

On Sept. 7th colchicum was given, and on Oct. 12th cinchophen grs. 7 three times daily was ordered for 14 days. On Nov. 30th cinchophen was again ordered for a period of 14 days. In all, grs. 588 cinchophen were taken. The patient next attended hospital on Jan. 1st, 1929, when she was admitted in a deeply jaundiced condition. She stated that four weeks previously—i.e., shortly after starting the second course of cinchophen—she had begun to suffer from nausea and anorexia. During the two weeks before admission she had become increasingly jaundiced, with pale stools and dark urine. She had frequently vomited, usually about two hours after food, was losing weight, and complained of intense pruritus and giddiness but had no abdominal pain.

There was nothing of significance in the past history. She had never been pregnant.

On examination, the patient was found to be moderately wasted and the skin and sclerotics were deeply jaundiced. There was tenderness and rigidity in the right hypochondrium and the liver was just felt. The systolic blood pressure was 165 mm. and the diastolic 70 mm. On admission the temperature was 97·8° F., the pulse-rate 80, and the respiration-rate 20. A blood count showed 4,800,000 red cells; hæmoglobin, 50 per cent.; colour-index, 0·52; white cells, 7600. The differential count of the white cells was normal. The urine contained a large amount of bile-pigments but no albumin or sugar. The patient gradually became more drowsy and finally completely unconscious, dying eight days after admission. The illness was apyrexial.

At *necropsy* (P.M. 19/1929) the liver was very small and weighed 850·5 g. The capsule was thickened over the lower part of the right lobe. The cut surface showed a net of sunken red lines enclosing rounded areas of swollen greenish-yellow parenchyma, and a few ill-defined sunken red areas (up to 5 by 2 mm.) chiefly in the lower part of both lobes. The bile-ducts and gall-bladder were not dilated. Microscopically, pseudolobules of regenerated parenchyma are separated by trabeculæ of necrosed tissue, which have the distribution of the fibrous trabeculæ in a portal fibrosis. The trabeculæ are for the most part broad, and they blend in places with areas in which many lobules have been destroyed. In the trabeculæ and larger areas the hepatic columns are replaced by a few, scattered, small, fatty, hepatic cells and phagocytes containing fat, the capillaries are dilated and the reticulum is swollen but shows little or no fibroblastic proliferation. About the portal systems this tissue is denser, contains few capillaries, is traversed by pseudobile canaliculi, and is infiltrated with numerous lymphocytes, neutrophil and eosinophil leucocytes, and monocytes. Nowhere, however, does this tissue contain elastic fibres. In the pseudolobules many canaliculi within cell-columns are distended with bile, and there are a few small rounded areas of bile-stained, necrosed hepatic cells devoid of fat. In short, the liver shows a "red atrophy" which has the distribution of a common or portal fibrosis.

CASE 2.—A stevedore, aged 63, was admitted to St. George-in-the-East Hospital on Dec. 9th, 1929, suffering from an acute attack of gout involving the metatarsal and phalangeal joints of both great toes. He was given mistura colchici, and also, on Dec. 11th and 12th, cinchophen grs. 7½ every four hours. He had four doses each day—a total of grs. 60 of cinchophen. Radiant heat and massage were also given. He made a good recovery and was discharged on Jan. 24th, 1930, apparently well.

On April 11th, 1930, he was admitted to the London Hospital deeply jaundiced. Two weeks previously—i.e., 15 weeks after the administration of the cinchophen—he had a sudden attack of pain in the lower half of the abdomen, doubling him up and making him sweat and feel faint. Bismuth tablets relieved the pain somewhat, but he then vomited with considerable relief. The pain was worse after food, and on two further occasions was relieved by vomiting. Then, for one week, the pain was easier but always more severe at night than during the day. During this week he vomited twice but with no relief from the pain.

Four days before admission jaundice was first noticed and his stools also became light in colour. During the preceding six months he had lost 1 st. in weight. There was no history of similar attacks nor of any attacks of indigestion. Twenty-five years previously he had had an

attack of gout but no further attacks until that in December, 1929. He had been a heavy beer-drinker until a year before admission, but since he had drunk very moderately. There was no history of venereal disease.

Examination showed the patient to be deeply jaundiced, with a dry, furred tongue. On the left ear was a small tophus and on the fingers several nodules. There was also severe pyorrhœa. The abdomen was distended, tender in the right hypochondrium, and the liver was felt 4 in. below the costal margin. In the examination of the heart, lungs, and central nervous system nothing abnormal was detected. The systolic blood pressure was 160 mm. of mercury and the diastolic 100 mm. The urine was deeply bile-stained and contained a trace of albumin but no sugar. The deposit contained a few epithelial cells. An opaque meal showed an ulcer on the lesser curve of the stomach.

On April 24th the blood-urea was 37 mg. per cent. and the blood-sugar 87 mg. per cent. The patient's condition gradually became worse, he became first drowsy and irritable and then comatose, dying 16 days after admission. Except for a rise of temperature to 100·5° on the day of death there was no pyrexia.

At *necropsy* (P.M. 198/30) the liver was small and weighed 978 g. The outer surface showed smooth, raised yellow areas, of which one measured 14 by 7 cm. and the others 5 by 3·5 cm. or less. Between these the surface was shrunken and brownish-yellow. On the cut surface raised, bright yellow areas of parenchyma lay in a sunken brown or brownish-red tissue. As in trinitrotoluene poisoning most of the remaining parenchyma occupied the upper part of the right lobe. Microscopically the centres of the lobules in the parenchymatous areas contain a very few necrosed, occasionally fatty, cells, and the interstitial reticulum is slightly swollen. Round this there is usually a zone in which the hepatic cells are more numerous but are dissociated and necrosed. Uniting the portal systems to each other and to these central areas of atrophy are trabeculæ in which the hepatic cells are represented by a very few, small, somewhat fatty examples, the reticulum is more abundant and shows a slight proliferation of fibroblasts, and the capillaries are sometimes dilated. Round the portal systems are many pseudobile canaliculi, and an infiltration which is similar in character to that in Case 1 but less abundant. The resulting net of atrophy cuts the parenchyma into discrete areas in which there is evidence of regeneration. Many canaliculi within the hepatic columns are distended with bile. The areas of parenchyma vary in size, but most are very small. In a few of the smallest the hepatic cells are necrosed. In the sunken tissue large portions of liver have undergone a similar but complete destruction. Portal systems surrounded by pseudobile canaliculi lie close together, and between them are changes similar to those that have been described in the centres of lobules, except that the interstitial reticulum is more abundant, and the necrosed, slightly fatty, hepatic cells are scantier. There are no elastic fibres outside the portal systems in the trabeculæ and areas of atrophy. The changes in general are similar to those in Case 1, but destruction of the liver is much more extensive. There is no appreciable difference in the age of the granulation tissue in the two cases.

In the stomach a peptic ulcer, measuring 1·5 by 1·8 by 0·24 cm., lay upon the lesser curve 8 cm. from the pylorus and 8·5 cm. from the cardia, and there were numerous very shallow erosions along the greater curve. There were streaks of altered blood in the stomach, and altered blood in the upper jejunum. Microscopically, the ulcer is shallow and crateriform; it has passed through the muscularis, and is bounded by a narrow zone of dense fibrous tissue, which is continued for a considerable distance along the submucosa and subserosa. An artery opens upon the surface, and a large artery in the base shows advanced endarteritis.

CASE 3.—A woman, aged 39, married, was admitted to the London Hospital on July 15th, 1930. She had suffered from arthritis for several years, her joints had become fixed, and she was unable to use her limbs. For two months she had taken cinchophen grs. 7 three times daily, with considerable improvement in the joint condition. Six days before admission she had a sudden attack of severe lower abdominal pain, which doubled her up. She vomited about half a pint of greenish fluid. Later in the day she improved slightly but vomited again the following morning. Four days before admission she again vomited and for the first time noticed that her skin was turning yellow. The urine was dark but she noticed no change in the colour of her stools. The abdominal pain continued intermittently.

On the day of admission she felt "very queer" and rather drowsy, complaining of headache and great thirst. During the previous eight months she had lost 2 st. in weight. Except for an attack of pleurisy in 1918 the past history was uneventful. She had one child, born in 1914, and no miscarriages.

Examination showed a thin, slightly lethargic woman with moderately intense jaundice of the skin and conjunctivæ and a furred tongue. The fingers and toes were clubbed. A slightly tender liver was felt one and a half inches below the costal margin, but the spleen was not palpable and there was no rigidity of the abdominal wall. A systolic murmur was heard in the pulmonary area but the heart was not enlarged. The systolic blood pressure was 130 mm. and the diastolic 90 mm. Her lungs were normal, and, apart from severe asthenia, there were no abnormal signs found in the central nervous sytem. The metacarpal and interphalangeal joints of the fingers were swollen and tender, and on the dorsum of the wrists and on the elbows were several rheumatic nodules.

The urine contained bile-pigment but no albumin or sugar. In the deposit were a few leucocytes and epithelial cells, but no crystals of leucine or tyrosine were seen. Culture of the urine was sterile. The blood-sugar was 108 mg. per cent., serum calcium 9·6 mg. per cent., plasma phosphorus 3·25 mg. per cent. The fragility of the blood was normal and the coagulation time 1 min. 30 sec. The direct van den Bergh reaction was positive, the indirect showed 5 mg. per cent. bilirubin. The blood-urea was 54 mg. per cent., and 70 per cent. of the phenol-sulphone-phthalein was excreted in two hours. The blood count was as follows: 4,800,000 red blood-cells, 62 per cent. hæmoglobin, colour-index 0·64, white cells 4600 with a normal differential count.

The patient was given a fat-free diet with large amounts of glucose. Ten c.cm. calcium gluconate [10] were given intravenously every four hours for two days and then twice daily for ten days. She gradually improved, and three days after admission the liver could not be felt. The drowsiness persisted for nearly a fortnight, a great improvement then took place accompanied by a very definite diminution in the intensity of the jaundice. Throughout the illness the patient remained afebrile. She was discharged from hospital 23 days after admission feeling very well. She has since remained in good health.

Review of the Symptoms

It is thus apparent that the manifestations of poisoning by cinchophen are numerous. They may be classified as follows:—

1. *Cutaneous.*—Various rashes have been described: scarlatiniform, purpuric, erythematous, and an urticarial eruption with or without œdema. Pruritus is not uncommon. The skin lesions may occur alone or in association with jaundice.

2. *Vasomotor.* — Palpitation, giddiness, collapse, fall of blood pressure, rapid pulse, and cyanosis may follow even one dose of cinchophen.

3. *Gastro-intestinal.*—Anorexia is not infrequently an early symptom of intolerance to cinchophen. Nausea, vomiting, abdominal discomfort, or even severe epigastric pain may occur.

4. *Hepatic.*—The onset of jaundice is the first definite indication of involvement of the liver. Before the appearance of jaundice the symptoms are often those of gastro-intestinal disturbance. Once jaundice has appeared it may be only transient or it may persist for some time, the patient eventually either recovering or dying. Occasionally the disease progresses rapidly to a fatal termination. In many cases loss of weight has been a prominent feature before the onset of jaundice. At autopsy there is found destruction of liver-cells, but in those cases where the process has been more chronic there may be a widespread fibrosis and even attempts at regeneration of liver tissue.

5. *Renal.*—Occasionally a transient albuminuria may appear, and in these cases white blood-cells and casts have been found in the urine. In one patient evidence of nephritis was found at autopsy.

6. Exacerbation of the joint condition, fever, and malaise have also been recorded following the use of cinchophen.

CONSIDERATION OF THE HEPATIC MANIFESTATIONS OF CINCHOPHEN POISONING

I have found records of 35* cases of jaundice following the ingestion of cinchophen; of these, 12 were males, 16 females, and in 7 cases the sex was not stated. Of the total, 17 recovered and 18 died; of the males, 6 recovered and 6 died; of the females, 5 recovered and 11 died, and in those cases where the sex was not stated 6 recovered and 1 died. These figures are set forth in Table I.

TABLE I

Sex.	Recovered.	Died.
Male	6	6
Female	5	11
Sex not stated ..	6	1
Total ..	17	18

Table II. shows the recoveries and deaths in the different age-groups.

TABLE II

Age-groups.	Males.		Females.	
	Recovered.	Died.	Recovered.	Died.
21–30	—	—	1	1
31–40	2	—	3	3
41–50	1	2	—	1
51–60	3	2	—	4
61–70	—	2	1	2
Total ..	6	6	5	11

The figures are too few to attempt to draw any definite conclusions, but it would seem that the prognosis, once jaundice has appeared, is worse in females than in males and in those patients who are over the age of 50.

In several of those cases where toxic jaundice has followed the use of cinchophen there were factors present which could reasonably be supposed to have rendered the liver more susceptible to the toxic action of the drug. In three of the fatal cases operations were performed, and in two other cases there were definite histories of alcoholism. Other factors which would appear to have exerted an adverse influence are the administration of protein shock, the presence of syphilis or carcinoma, and also pregnancy.

It should also be noticed that although the cutaneous manifestations of cinchophen poisoning were first recognised in 1913, it was not until 1923 that jaundice was described. This may have been due to failure to recognise the condition, or alternatively to some difference in the constitution of the drug as manufactured in 1913 and 1923, a change due possibly to conditions of war.

The appearance of toxic symptoms does not appear to depend on the amount of the drug taken, the milder symptoms having followed the ingestion of a single dose of grs. 7½.

The smallest amount which has resulted in death in any of the cases described above is grs. 60 taken during a period of two days (London Hospital, Case 2). This case also is remarkable for the long latent period, 15 weeks elapsing before the appearance of any toxic manifestations. In other cases considerable amounts have been taken over long periods before the appearance of any signs of toxicity.

It has been suggested by Graham [12] that the drug should only be given three times daily for three consecutive days each week and that it should never be given for more than three days without a four days' rest, but even this dosage has resulted in symptoms of poisoning in certain cases. The simultaneous administration of alkalis also does not appear to have been of any definite value.

* This includes one case where there was no visible jaundice, but the plasma of the patient gave a delayed direct van den Bergh reaction.

Treatment

The drug should of course be stopped at the first appearance of any toxic phenomena and the patient kept under observation. In those cases showing vasomotor disturbances or cutaneous manifestations the appropriate symptomatic treatment should be carried out.

In the more severe cases glucose should be given in large amounts either by mouth or, if this is not possible, intravenously. It would seem reasonable to give insulin along with the glucose but its administration should be controlled by estimations of the blood-sugar.

In view of the work of Minot and Cutler [13] on the protective action of the calcium salts in the prevention and treatment of experimentally produced necrosis of the liver, this form of therapy might well be used. In Case 3 (London Hospital) it appears to have been of some value, though of this one cannot of course be certain. Calcium salts should be given intravenously either in the form of calcium gluconate or of a 5 per cent. solution of calcium chloride which must be given very slowly.

Conclusions

The use of cinchophen may be followed by various manifestations of toxicity, and a number of fatalities following its use have now been established. On the other hand the drug has proved to be of undoubted value in certain cases of gout which have resisted all other forms of treatment. The question therefore arises as to when its use is justified. In those cases of gout where the attacks are infrequent, where the process is not severe, or where colchicum or other remedies alleviate the symptoms, it probably should not be used. In the severe cases where other treatments have been of no avail cinchophen may be used provided that the danger is recognised and adequate caution is exercised. The patient should be tested with a small initial dose. If there is no evidence of idiosyncrasy it should be given in the manner advised by Graham,[12] that is, grs. 10 three times daily for three days a week. Alkalis may be coincidently administered. Evans and Spence [15] have suggested the use, in susceptible cases, of small doses distributed throughout the week.

SUMMARY

1. Cinchophen may give rise to various toxic manifestations. 2. Thirty-five cases of jaundice following the use of cinchophen are discussed, including three hitherto unpublished cases. 3. Attention is directed to certain accompanying conditions, for example, alcohol, syphilis, pregnancy, and other conditions known to affect the liver which may well have rendered the liver more susceptible to cinchophen in some of the above cases. 4. The toxic effects are not directly related to the amount of the drug taken. 5. Calcium may be of value in the treatment of severe cases of poisoning by cinchophen. 6. Cinchophen should not be used as a routine measure in the

treatment of gout. Its use should be reserved for those cases in which other methods have proved inadequate.

For the pathological reports on Cases 1 and 2 (London Hospital), I am indebted to Prof. H. M. Turnbull, to whom my best thanks are due. I must also thank Dr. Robert Hutchison, Dr. Theodore Thompson, and Sir Robert Woods for permission to publish details of the cases which were under their care in the London Hospital. It is a pleasure to express my gratitude to Prof. A. W. M. Ellis for his invaluable help in the preparation of this paper.

REFERENCES

1. Döbner, O., and Giesecke, M.: Ann. d. Chem., 1887, ccxlii., 290.
2. Nicolaier, A., and Dohrn, M.: Deut. Arch. f. Klin. Med., 1908, xciii., 331.
3. Martindale, W. H., and Westcott, W. W.: Extra Pharmacopœia, London, 1928, i., 317.
4. "Weldona": Jour. Amer. Med. Assoc., 1927, lxxxix., 1167.
5. Schering, Messrs.: Brit. Med. Jour., 1926, ii., 93.
6. Boots, R. H., and Miller, C. P.: Jour. Amer. Med. Assoc., 1924, lxxxii., 1028.
7. Braun, L. I.: Jour. Med. Assoc. S. Africa, 1929, iii., 157.
8. Glover, L. G.: Brit. Med. Jour., 1926, ii., 136.
9. Klinkert, D.: Therap. d. Gegenw., 1926, lxvii., 334.
10. Anderson, S. D., and Teter, D. P.: Jour. Amer. Med. Assoc., 1929, xciii., 93.
11. Hitzenberger, H.: Wien. Klin. Woch., 1927, xl., 205.
12. Graham, G.: Proc. Roy. Soc. Med., 1927, xx., 257.
13. Cabot, R. C.: Boston Med. and Surg. Jour., 1925, cxcii., 1123.
14. Grolnick, M.: Med. Jour. and Rec., 1930, cxxxii., 240.
15. Parsons, L., and Harding, W. G.: Amer. Jour. Med. Sci., 1931, clxxxi., 115.
16. Willcox, W.: Brit. Med. Jour., 1926, ii., 273.
17. Woodwark, A. S.: St. Bart.'s Hosp. Jour., 1912, xix., 216.
18. Evans, G., and Spence, A. W.: THE LANCET, 1929, i., 704.
19. Phillips, J.: Jour. Amer. Med. Assoc., 1913, lxi., 1040.
20. Herrick, W. W.: Ibid., 1913, lxi., 1376.
21. Marañon, G.: Ibid., 1914, lxii., 2254 (Abstr.).
22. Hanzlik, P. J., and others: Ibid., 1921, lxxvi., 1728.
23. Schroeder, K.: Brit. Med. Jour (Epit. Curr. Med. Lit.), 1923, i., 2.
24. Worster-Drought, C.: Brit. Med. Jour., 1923, i., 148.
25. Wells, C. J. L.: Ibid., 1926, ii., 759.
26. Evans, G.: Ibid., 1926, ii., 93.
27. Rake, G. W.: Guy's Hosp. Rep., 1927, lxxvii., 329.
28. Rabinowitz, M. A.: Med. Clin. of N. America, 1928, xi., 1025.
29. Weil, P.: Med. Welt., 1928, ii., 257.
30. Loewenthal, L. J. A., and others: Brit. Med. Jour., 1928, i., 592.
31. Sutton, D. C.: Jour. Amer. Med. Assoc., 1928, xci., 310.
32. Klinkert, D.: Therap. d. Gegenw., 1928, lxix., 140.
33. McVicar, S. C., and Weir, J. F.: Med. Clinic of N. America, 1929, xii., 1526.
34. Reichle, H. S.: Arch. Int. Med., 1929, xliv., 281.
35. Dassen, R.: Jour. Amer. Med. Assoc., 1929, xcii., 1563 (Abstr.).
36. Fink, A. I.: Jour. Allergy, 1930, i., 280.
37. Stacy, L. J., and Vanzart, F. R.: Minnesota Med., 1930, xiii., 327.
38. Minot, A. S., and Cutler, J. T.: Proc. Soc. Exp. Biol. and Med., New York, 1928–29, xxvi., 138 and 607.
39. Rabinowitz, M. A.: Jour. Amer. Med. Assoc., 1930, xcv., 1228.
40. Scully, F. J.: Ibid., 1924, lxxxii., 623.
41. Barron, M.: Ibid., p. 2011.
42. Petty, M. J.: Brit. Med. Jour., 1928, ii., 442.

THE THERAPEUTIC APPLICATION OF GONADOTROPIC HORMONES

("RHO FACTORS")

BY R. W. JOHNSTONE, C.B.E., M.D., F.R.C.S. EDIN.

PROFESSOR OF MIDWIFERY AND THE DISEASES OF WOMEN IN THE UNIVERSITY OF EDINBURGH

B. P. WIESNER, PH.D.

LECTURER IN ANIMAL GENETICS

AND

P. G. MARSHALL, B.SC.

OF THE DEPARTMENT OF ANIMAL GENETICS IN THE UNIVERSITY

RECENT research into the mechanism of the sex cycle has followed three directions. Firstly, a firm basis for the application and interpretation of experiments on laboratory animals has been produced by the elucidation of the nature of the menstrual cycle. It was believed that menstruation represents the equivalent of œstrus bleeding, or "estruation" as the Americans call it; but it is now recognised that it is simply the end of a pseudopregnancy, and that a study of the latter is the only hope of elucidation of the premenstruum. Secondly, the complicated character of ovarian secretion is beginning to be recognised. The existence of two factors has been definitely established: one which is usually referred to as œstrin, folliculin, theelin, or menformon (α-factor), and another which is secreted by the corpus luteum and affects mainly the endometrium (progestin, or β).

But even the incomplete evidence at present available makes it reasonable to assume that two other factors, not yet isolated, are secreted by the ovary—one influencing metabolism, the other responsible for the change in the uterine musculature which becomes manifest during pregnancy and pseudopregnancy and which is characterised by the disappearance of the response (contraction) to pituitrin.

Thirdly, it has been shown that the hormone of the anterior lobe of the pituitary, which incites and conditions ovarian function, can be extracted and purified by certain methods. These methods, based on the precipitation of the active substance by volatile media in the presence of electrolytes or by the formation and subsequent disruption of water-insoluble compounds, have made it possible to prepare non-toxic extracts of considerable purity (20,000–200,000 mouse units per g.). It may be recalled that recent experiments with such preparations have lent further support to the view that the gonadotropic (gonad-stimulating) fraction of the anterior lobe consists of at least two distinct factors (ρ_1 and ρ_2)—a conclusion originally reached by Wiesner and Crew, working with anterior lobe material, but also arrived at shortly afterwards by Zondek and Aschheim, working with pregnancy and other urines. The latter authors proposed the terms Prolan A and B for the œstrogenic and kyogenic factors (ρ_1 and ρ_2) respectively. It may be emphasised that, in our considered opinion, all known extracts claimed to contain only one gonadotropic hormone really represent mixtures of the two factors, and that where such extracts are used—from whatever source they may be prepared—in clinical cases, in all probability the whole complex of ovarian secretion is stimulated. Thus, given sufficiently large doses, the uterine changes characteristic of the gestational function of the uterus should result—i.e., endometrial development, desensitisation of the musculature, &c.—whilst smaller doses should cause the ρ_1-effect (development of follicles, &c.) to predominate. It is by no means certain that the preparations which incite ovarian secretion are completely defined as to their physiological activity by a reference to their "gonadotropic" character. Recent work (unpublished) carried out in the Macaulay Laboratory of the Department of Animal Genetics, Edinburgh, indicates that these preparations affect reproduction directly and not only via the ovary, and supplies further evidence of the complex nature of the preparations, both as regards effects and chemical constitution.

Thus the future may make additions to the list of individual hormones to be considered in clinical problems; on the other hand some simplification has resulted recently—e.g., as regards the placental hormone on which J. B. Collip reported and which is, in all probability, not gonadotropic in nature. From a careful repetition of this work in the Department, it seems likely that the effects produced by a placental extract as described by Collip are due to traces of

œstrin (α-factor), which are only removed with difficulty by the procedure he adopts.

During the last two years we have been subjecting preparations of the ρ-factors to clinical tests in carefully selected cases, in which it seemed desirable on physiological grounds to attempt to induce, restore, or reinforce ovarian secretion. It may be of interest to summarise briefly the indications which were chosen, and to give a preliminary impression of our experiences. The aims which we might reasonably hope to achieve were formulated as the correction of purely functional disturbances of menstruation—amenorrhœa, menorrhagia, and dysmenorrhœa, and the prevention of what may be called "functional" abortion—that is to say, abortion due to no recognisable organic cause, and therefore presumably (or at least possibly) due to deficiency of a necessary hormone.

This preliminary note is not concerned with numbers of cases or percentages of results, which will be published later; our desire is merely to indicate the directions in which our experience points. It may, however, be opportune to emphasise that careful selection of purely functional cases must always severely limit the number of cases dealt with in any one hospital clinic.

AMENORRHŒA

In *primary* amenorrhœa we have found that injections of α (œstrous hormone) may produce a slight bleeding which is probably œstrous in type—i.e., does not indicate the breakdown of a pseudopregnancy-epithelium. Injection of both ρ-factors has failed to produce regular menstruation, although experiments on animals have shown that large quantities of gonadotropic hormones produce that phase of ovarian secretion which is responsible for the phenomena of pseudopregnancy—the equivalent of the premenstrual phase. But it cannot be excluded that cases of primary amenorrhœa may not respond to gonadotropic hormones because of some developmental abnormality. It has been shown that the ovaries of very young animals do not respond to gonadotropic hormones and it may be that this non-reactivity persists in some cases. Moreover, our knowledge regarding the physiology of menstruation is as yet insufficient to provide an absolutely reliable basis for hormonic treatment; the experiments of American authors, primarily of Hartmann and his colleagues, have indicated that the occurrence and the disappearance of ovarian secretion may not represent the whole determining factors.

In *secondary* amenorrhœa we have had a high proportion of cures as a result of injection of the ρ-factors. One case may be recorded as an example of several.

Hospital nurse, aged 26. Regular from 14 years to 23, when periods gradually stopped. When brought under treatment there had been no menstruation for 18 months; patient suffered from frequent headaches. No recognisable organic disease. After eight injections on alternate days she had a "period" lasting a few hours. The injections were continued thrice weekly, and a month later she menstruated for two days, "quantity average." Injections stopped. Twenty-eight days later a normal period of three days, and since then regular menses for now over a year.

The explanation must in some measure remain a matter of opinion and conjecture—possibly the condition was due to a too persistent corpus luteum, or possibly to pituitary deficiency—of which, however, there was no outward sign.

MENORRHAGIA OF FUNCTIONAL ORIGIN

Cases in which menorrhagia of functional origin has been treated successfully have been recorded already by several observers. The field for hormone treatment here is probably considerable, but the conditions of hospital practice—particularly the need to get the patients well as soon as possible, and the difficulty of being certain that a case is purely functional without a preliminary curettage, which frequently cures the condition temporarily—have kept down our numbers. Thus, for example, we have not used it in metropathic cases near the menopause, because radium produces a more rapid and permanent result. We have had a small number of cases in young unmarried women in which injection treatment was successful without any other treatment or modification of the mode of life. In some of these the effect was prompt—e.g., eight-day periods with many large clots were reduced to normal four-day periods without clots after six or eight injections during the fortnight preceding the period. In others two or three months' treatment was necessary. Two cases of "the menorrhagia of puberty" in girls of 12 and 13 have responded promptly and have continued normal for many months.

DYSMENORRHŒA

Intrinsic (functional or spasmodic) dysmenorrhœa has yielded some results of a striking nature, even when every care has been taken to exclude the influence of suggestion which may be such a potent factor in the subjects of this complaint. So important is the question of the cure of this condition from a social standpoint, when one considers the amount of disability and lost working-time caused by it, that we have determined to concentrate upon this test for the next few months. Our colleagues, Dr. James Young and Dr. Theodore Haultain in Edinburgh and Prof. James Hendry in Glasgow, are collaborating with us in this clinical research, and results will be published in a joint report when a number of cases sufficient to justify definite conclusions has been treated. Meantime, however, the theoretical basis upon which we are working may be briefly stated.

During the pseudopregnancy which is represented by the premenstrual phase the uterus appears to exhibit a lesser degree of spontaneous activity or reactivity to pituitrin. Just before or during menstruation spontaneous activity of the uterus appears to be increased, and dysmenorrhœa may be regarded as due to excessive muscular activity of the uterus, perhaps combined with an abnormally low degree of degeneration of the proliferated endometrium.

Now it has been shown both by workers abroad and in Edinburgh that the decreased activity and reactivity of the uterus during pseudopregnancy is due to a secretion of the corpus luteum, which is probably not identical with the factor responsible for the proliferation of the endometrium. It should be possible to reduce the excessive muscular activity of the uterus, which we are inclined to regard as the physiological basis of dysmenorrhœa, either by administration of corpus luteum extracts which are capable of eliminating the reactivity of the uterus to pituitrin and thus reducing its spontaneous activity, or else by stimulating the corpus luteum by means of gonadotropic hormones.

PREVENTION OF ABORTION

Experiments have shown that an adequate supply of ovarian hormones (in particular luteal hormones) is necessary if pregnancy is to proceed normally. Insufficiency of ovarian secretion may be held responsible in some cases for premature termination of pregnancy. Ovarian—and particularly luteal—secretion can, however, be maintained or intensified by administration of ρ-factors which may, therefore, be useful in cases of habitual abortion.

Nine cases of very gratifying success have been observed in which the patients gave a history of repeated abortions without recognisable cause. The

first of these was, owing to our inexperience in dosage, the most striking.

A young married woman had aborted in her first three pregnancies. No organic cause had ever been found, and the Wassermann reaction of husband and wife was negative. Repeated disappointment was having a very seriously depressing effect upon her mind. In her fourth pregnancy she received injections of ρ-factors thrice weekly for the first six months, and thereafter twice a week up to the thirty-sixth week. No other precautionary treatment was adopted, except rest at the monthly epochs, which had been observed also in the second and third pregnancies without avail. The fourth pregnancy went to term and 12 days past it; labour was normal, except that the placenta was adherent; the child was alive and healthy. The facts that the pregnancy went beyond term, and that the placenta was adherent, seem to provide additional evidence that the corpus luteum had been activated by the ρ-factors. In all the later cases the injections were accordingly stopped at the seventh month, and healthy children were born after normal labours.

Evidence of a different but analogous type was provided by a childless woman of 40, who had twice previously conceived at intervals of some years and each time had aborted.

In her third pregnancy she received injections of ρ-factors from the second to the fifth month. Her doctor in the country then concluded that the pregnancy was not continuing, and examination showed that the uterus was about the size of a two months' pregnancy. Curettage removed an ovum (embryo largely absorbed) which corresponded in the size of the placenta to a two months' pregnancy. It seems legitimate to conclude that the stimulation of the corpus luteum in this case had prevented the uterus from expelling its contents, even although the ovum had perished.

It would be beyond the purpose of this note to detail the histories of all the other cases; suffice it that all had had two or more abortions, unexplained by any recognisable organic cause. In all the Wassermann reaction was negative. In two the abortions occurred at the outset of married life, in the others there had been one or more normal pregnancies first. In two cases a tubal pregnancy had occurred in addition to uterine abortions. Eight of the nine completed cases have been successful. The ninth is the case mentioned above. Several other cases are progressing successfully at present—notably one hospital patient who has had five miscarriages between the third and fifth months and no living child, and who is now seven months' pregnant and doing well.

It will be appreciated that these cases of habitual abortion are in a different category from cases of threatened abortion. The injections have been tried in four or five cases of the latter in which bleeding had begun, but without success. This is perhaps only to be expected, because, once separation of the ovum has begun, a local "mechanical" stimulant to uterine action is introduced, the control of which by hormones could be expected only in exceptional cases.

ACTION AND SOURCE OF THE HORMONES

In the course of our work other questions arose which may be briefly stated as follows: Do the sex hormones play a part in the maintenance of health in the normal woman of reproductive age? If so, are the quantity of sex hormones and the cyclical character of their production as necessary to the maintenance of health as to normal menstruation, or can normal health and metabolism be maintained on a lower threshold of sex hormones? In other words: (1) are pseudopregnancy (premenstrual) changes purely local, and the hormones which produce them purely local in their effects; or (2) are they of value in the general metabolism of the body; or (3) are they possibly harmful? The possible perfection of health before puberty and after the menopause, as well as in some cases of demonstrated absence of sex hormones during reproductive age, would seem to answer the first question in the affirmative. We know of no evidence to affirm the third question. In regard to the second question, we have evidence that the action of thyroxin, recognised as being less efficient in the very young or old, can be intensified by stimulating ovarian function. Our experience does not enable us to say whether normal metabolism demands the same quantity and the cyclical production of the sex hormones as the normal menstrual rhythm requires.

The extracts used in these experiments were of two kinds. In our early experiments we used extracts from human placenta prepared by the sulphosalicyclic acid method published previously. These extracts, however, were not entirely satisfactory, mainly because they became inactive very quickly and tended to form a deposit which made administration more difficult, while the concentration of the active factors was also very low. During the last year extracts prepared from pregnancy-urine by a method published elsewhere[1] were used. With the exception of one case, where some local reaction was observed, no adverse effects followed the injections. It is difficult to state with any degree of reliability the concentration employed, since the so-called "mouse unit" to which other authors refer is of more than doubtful value in determining the concentration of gonadotropic hormones, as has been shown in a previous publication. Accepting for the moment Dickens's definition of the mouse unit, 1 c.cm. of the solution employed during the last year contained about 50 mouse units, and up to 2000 mouse units were administered. In all cases care was taken to spread the administration over considerable periods, so as to avoid those dangerous reactions of the ovary which may occur after rapid administration of large doses to experimental animals.

BACILLURIA UNDER KETOGENIC TREATMENT

By Anson L. Clark, M.D.

of the section on urology, mayo clinic, rochester, minn.

If proof of the chronicity of cystitis, and evidence of inability to do much for it are needed, one has only to refer to the advertisements of new and sundry treatments. Were a remedy ever discovered which would fulfil the claims for each of them there would be no further need for new remedies, many of which do little but colour the urine of the patient any shade desired.

One of the most common offenders in infections of the urinary tract is the colon bacillus.[2] A. T. Shohl and J. H. Janney, in a paper in the *Journal of Urology*, April, 1917, showed that the growth of the colon bacillus in urine is inhibited at a pH of approximately 4·6 to 5·0, and that in highly buffered mediums such as urine the growth is inhibited at a higher pH than in other culture mediums. The

[1] Wiesner and Marshall: Quart. Jour. Exp. Physiol., 1931, xxi., 147.

[2] In other articles, written for North American journals, I have endeavoured to conform to the nomenclature of the Society of American Bacteriologists, and have used the term "Escherichia coli." Similarly, in previous articles I have written "Aerobacterium aerogenes" for the older term "Bacillus aerogenes."

occasion for using the treatment I am recommending here was an effort to increase the acidity and inhibit the growth of the colon bacillus in a resistant case of bacilluria, in which various types of treatment had been applied in the previous 18 months. The patient was given the ketogenic diet. In seven days the urine had cleared and the symptoms were relieved. In 12 days the urine gave no growth on culture, and after 20 days the patient returned to a mixed diet. At numerous times during the year which has elapsed since these results were obtained I have made cultures of the urine of this patient, and have found it apparently free of the colon bacillus.

In 50 cases of bacilluria in which the ketogenic treatment was applied, the following experience was gained, while conclusions have been drawn concerning conditions necessary to success of efforts to eliminate the bacillus from the urinary tract.

1. It is essential that the patient be able to develop ketone bodies in the urine. A quick method of ascertaining whether these substances are present in the urine is to add 8 or 10 drops of a 10 per cent. solution of ferric chloride to 3 to 6 c.cm. of urine. If diacetic acid is present, the characteristic dark red colour will appear.

2. The acidity of the urine must be increased to a pH of at least 5·2. To effect this, it may be necessary to administer orally 6 g. of ammonium nitrate daily in the form of 12 enteric-coated pills of 0·5 g. each.

3. Any deviation from a prescribed diet will retard recovery. Many patients take something between meals which entirely offsets the work of the dietary treatment. Sufficient exercise to aid in oxidisation of the fat will assist in developing the ketosis.

4. The colon bacillus is more sensitive to this type of treatment than a number of other Gram-negative bacilli which are found in cases of urinary infection. The most difficult to eradicate is the *Bacillus aerogenes*.

5. The patient should be able physically to stand this change in diet. Moreover, certain persons will not digest fats, and others, if they do digest them, will not secrete the products in the urine. Still other persons will produce ketonurine but not hyperacid urine. In such cases, this form of treatment is unsuitable. If the pelves of the kidneys are involved, a much longer course of dietary treatment is required than if only the bladder is involved. After a patient is in ketosis, a period of from one to three weeks is required before cultures made from the urine will be free of growth. After this point is reached, the patient usually is directed to adhere to the diet a week longer, and then he is allowed to return to a mixed diet.

6. Where infection is present and considerable renal injury already has taken place, the patient may be found unable to secrete enough ketone bodies, or to secrete sufficiently acid urine to inhibit growth of the organisms. This was noted particularly in cases of an advanced hydronephrosis with infection. The pH of the urine from an infected kidney may remain always about 7·0 or at a pH that denotes even less acidity, while the urine from the uninfected kidney may be of a pH of 5·0 to 5·2.

A TYPICAL CASE

An interesting log was kept by a patient who is an expert bacteriologist and chemist. He was unable to remain at the clinic for treatment, and after the method of procedure had been carefully explained to him, he returned home and continued the regimen as outlined. Four months later, he sent a record of his progress (Table I.).

The man, who was aged 42 years, came to the Mayo Clinic on Dec. 12th, 1931, complaining of several recurrent attacks of cystitis, and rather severe systemic symptoms of fever and malaise. The previous diagnosis had been cystitis, prostatitis, and posterior urethritis, and the patient had received considerable oral medication, lavage of the bladder, and massage of the prostate gland. The general findings were negative. Tuberculosis of the urinary tract was ruled out. The upper part of the urinary tract seemed normal. The patient complained of burning on urination, frequency and urgency, with passage of urine three to four times a night. In the two-glass test both glasses of urine were cloudy. Culture of urine from the bladder revealed the colon bacillus. The patient was given the ketogenic diet, and the urine was acidified by giving orally 6 g. of ammonium nitrate daily. The urine became clear within a few days after the acidity had been increased, but the colon bacillus continued to appear on culture.

TABLE I.*—*Record of Case* †

Date.	Diet.	Ammonium nitrate taken each day, g.	pH of urine.	Plate count of culture; colon bacilli for each c.cm. of urine.
1931.				
12–16	Mixed.	6	6·9	Innumerable.
12–17	,,	6	5·6	,,
12–18	,,	6	5·2	Not taken.
12–19	,,	6	5·2	,,
12–20	,,	6	5·2	,,
12–21	Ketogenic.	6	5·2	,,
12–22	,,	6	5·2	15,000,000
12–23	,,	0	5·2	3,250,000
1932.				
1– 2	,,	0	5·0	80,000
1– 3	,,	0	5·0	18,000,000
1– 4	,,	0	5·0	46,000
1– 6	,,	0	5·0	16,000,000
1– 7	,,	0	5·0	11,000,000
1– 8	,,	6	4·9	640,000
1–10	,,	6	4·8	Not taken.
1–13	,,	6	4·8	,,
1–14	,,	6	4·8	,,
1–15	,,	6	5·0	No growth.
1–24	,,	0	5·4	,,
1–27	,,	0	6·6	,,
1–28	,,	3	6·9	,,
1–29	,,	6	5·0	,,
1–30	,,	0	5·0	,,
2– 3	,,	0	6·6	,,
2– 4	,,	0	6·9	,,
2–24	Mixed.	0	6·6	,,
2–29	,,	0	6·0	,,
3– 1	,,	0	6·8	,,
6– 1	,,	0	6·6	,,

* The tables are from Minor Surgery of the Urinary Tract, by H. C. Bumpus, Jnr., J. L. Crewshaw, and A. L. Clark, published for the Mayo Clinic by the W. B. Saunders Company, Philadelphia.

† Dec. 16th, the urine was cloudy; as the urine became more acid it became clearer, and Dec. 19th was clear, and remained so.

Comment.—In this case growth of the colon bacillus was considerably inhibited when the patient started taking the ammonium nitrate, and the urine became acid. The urine, however, did not become sterile until the ketogenic treatment was added. This may explain the frequency of recurrent attacks among those who have been afflicted with bacilluria. In many cases in the past with other treatment, growth of the organism probably has been inhibited, but the urine has not been rendered sterile to culture. When medication has been stopped, alkalinity of the urine has increased, and under more favourable

TABLE II.—*Method of Calculation for Ketogenic Diet*

Diet.	Carbohydrate, g.	Protein, g. (weight in lb.)	Fat, g.	Procedure.
1	E.C.* ×0·010	Adult 1/2 Child 2/3	E. C. ×0·10	—
2	E.C. ×0·008	Adult 1/2 Child 2/3	E.C. ×0·10	Continue indefinitely Diets 1, 2, and 3 to be used in order to develop or intensify ketosis if necessary.
3	E.C. ×0·006	Adult 1/2 Child 2/3	E.C. ×0·10	

* Total estimated calories (E.C.) = weight in pounds × 16 for adults; total estimated calories = weight in pounds × 25 for children.

TABLE III.—*Ketogenic Diet: the Mayo Clinic*

Adult patient, weight 156 lb., diet 1.
Carbohydrate 25 g., Protein 78 g., Fat 250 g.,
Calories 2662.

Food.	Breakfast, g.	Dinner, g.	Supper, g.	Total, g.	Carbohydrate, g.	Protein, g.	Fat, g.
Vegetables—							
String beans ..	—	50	—	100	3·0	1·0	—
Fresh cabbage .	—	50	—				
Mushrooms ..	—	—	50	100	3·0	1·0	—
Tomatoes ..	—	—	50				
Fruits—							
Orange ..	50	—	—	50	5·0	0·5	—
Pineapple .. (canned without sugar) ..	—	30	—	—	—	—	—
Apricots* ..	—	—	30	60	3·0	0·3	—
Bran soya muffins	1†	1†	1†	3	1·8	12·0	21·0
Cream, 40 per cent.	100	100	100	300	9·0	6·0	120·0
Bacon	20	—	—	20	—	4·0	10·0
Eggs	2†	—	—	2	—	12·0	12·0
Meat—							
Ham	—	90	—	170	—	42·5	25·5
Tenderloin ..	—	—	80				
Butter	15	15	30	75	—	—	63·7
Mayonnaise ..	—	15	—				

* Canned without sugar. † Unit, not g.

Breakfast.—Orange, 50 g.; bran soya muffin, 1; butter, 15 g.; 40 per cent. cream, 100 g.; bacon, fairly crisp, 20 g.; eggs, 2.
Dinner.—Baked ham, 90 g.; string beans, very tender, 50 g.; cabbage salad: cabbage, 50 g.; mayonnaise, 15 g.; bran soya muffin, 1; butter, 15 g.; apricots, canned without sugar, 30 g.; 40 per cent. cream, 100 g.
Supper.—Broiled tenderloin, 80 g.; mushrooms, 50 g.; sliced tomato, 50 g.; bran soya muffin, 1; butter, 30 g.; pineapple, canned without sugar, 30 g.; 40 per cent. cream, 100 g.

TABLE IV.—*Ketogenic Diet: the Mayo Clinic*

Adult patient, weight 156 lb., diet 2.
Carbohydrate 20 g., Protein 78 g., Fat 250 g.,
Calories 2642.

Food.	Breakfast, g.	Dinner, g.	Supper, g.	Total, g.	Carbohydrate, g.	Protein, g.	Fat, g.
Vegetables—							
Tomato	—	50	—	100	3·0	1·0	—
Head lettuce .	—	50	—				
Spinach ..	—	—	50	100	3·0	1·0	—
Radishes and celery hearts	—	—	50				
Fruits—							
Orange sections	30	—	—	30	3·0	0·3	—
Peaches* ..	—	—	40	40	2·0	0·2	—
Bran soya muffins	1†	1†	1†	3	1·8	12·0	21·0
Cream, 40 per cent.	50	100	100	250	7·5	5·0	100·0
Bacon	20	—	—	20	—	4·0	10·0
Eggs	2†	—	—	2	—	12·0	12·0
Meat—							
Roast lamb ..	—	90	—	170	—	42·5	25·5
Pork chop ..	—	—	80				
Butter	20	20	20	95	—	—	80·7
Mayonnaise ..	—	20	15				

* Canned without sugar. † Unit, not g.

Breakfast.—Orange, 30 g.; bran soya muffin, 1; butter, 20 g.; 40 per cent. cream, 50 g.; bacon, fairly crisp, 20 g.; eggs, 2.
Dinner.—Cream of tomato soup: 40 per cent. cream, 75 g.; tomato, 50 g.; roast lamb, 90 g.; head lettuce, 50 g.; mayonnaise, 20 g.; bran soya muffin, 1; butter, 20 g.; 40 per cent. cream, 25 g.
Supper.—Pork chop, 80 g.; spinach, 50 g.; celery hearts and radishes, 50 g.; mayonnaise, 15 g.; bran soya muffin, 1; butter, 20 g.; peaches, canned without sugar, 40 g.

conditions growth of the bacillus has precipitated another attack. It has also been found that as the body adjusts itself to the change after several weeks on a ketogenic regimen, the ketone properties of the urine become less marked. Therefore, when a very resistant bacillus, such as the *Bacillus aerogenes* is the infecting organism, it is advisable to give, in alternating periods, ketogenic and mixed diet. Following a period of three weeks on the ketogenic treatment, a mixed diet may be given for ten days or two weeks, and then the ketogenic diet may be resumed for three weeks. It has been observed, in some cases, that the ketone bodies in the urine were sufficient to acidify the urine, but in this case oral administration of some drug to acidify the urine was necessary.

EFFECT OF THE DIET

Results of this type of treatment suggest two questions, which if they can be answered in the future may considerably simplify the treatment of infections of the urinary tract: 1. Does the ketonuria have a real bactericidal effect on infections in the urinary tract? 2. Does ketonuria result merely in a medium that is deficient for growth of these bacteria and not in a really bactericidal medium? It has been said that the patient must adhere rigidly to the ketogenic diet. Tables and methods of calculation of such a diet have been published, and are here reproduced (Tables II., III., and IV.,) with a portion of the accompanying text, in which only the numbers of the tables have been changed. In Table II. is outlined a method for obtaining the calories required for 24 hours. The energy requirement for the ordinary adult patient is approximately 16 calories for each lb. of body-weight. The carbohydrates, proteins, and fats are then calculated according to diet 1 (Table II.); an example of the calculation is given in Table III. This diet is continued for two or three days, and then the patient is given diet 2 (Table II.); the calculation is illustrated in Table IV. If this is tolerated with ease, diet 3 (Table II.) is next prescribed.

CONCLUSIONS

In more than fifty cases it has been shown that hyperacidity and ketonuria will inhibit growth of organisms in cases of various bacillary infections of the urinary tract, so that cultures of urine become free of growth, and symptoms are relieved.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—There will be an all-day post-graduate course in diseases of the chest at the Brompton Hospital from Sept. 5th to 10th. From Sept. 6th to 30th a course in psychological medicine will be held at the Bethlem Royal Hospital, on Tuesdays and Fridays at 11 A.M. From Sept. 12th to 24th there will be afternoon courses in infants' diseases at the Infants Hospital, and in ophthalmology at the Royal Eye Hospital. An all-day course for men only in medicine, surgery, and the specialties will take place at the Westminster Hospital from Sept. 19th to Oct. 1st. All courses arranged by the Fellowship of Medicine are open only to members. Further particulars may be had from the Fellowship at 1, Wimpole-street, London, W. 1.

WELSH HOSPITALS.—A new isolation hospital, erected at a cost of £27,000, was recently opened at Groeswen, Margam, Glamorganshire. The new building, which stands in four acres of ground at the foot of Margam mountain, comprises an administration block, two pavilions, each containing two wards of 16 beds, a cubicle block with eight beds, and the usual attendant accommodation.—In commemoration of the tenth anniversary of the opening of the Towyn war memorial cottage hospital, Sir Howell Williams laid the foundation-stone of a maternity wing, the first maternity centre in the whole of Merionethshire. The hospital serves a wide district, including two seaside towns, four villages, and two rural areas.

CLINICAL AND LABORATORY NOTES

A SIMPLE APPARATUS FOR VENESECTION

By C. C. Okell, *M.C.*, M.D. Camb., F.R.C.P. Lond.
PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY OF LONDON AT UNIVERSITY COLLEGE HOSPITAL
AND
P. D'Arcy Hart, M.D. Camb., M.R.C.P. Lond.
ASSISTANT TO THE MEDICAL UNIT OF THE HOSPITAL

THE apparatus here described has been used recently in order to obtain serum for measles prophylaxis, and also for a number of routine venesections.

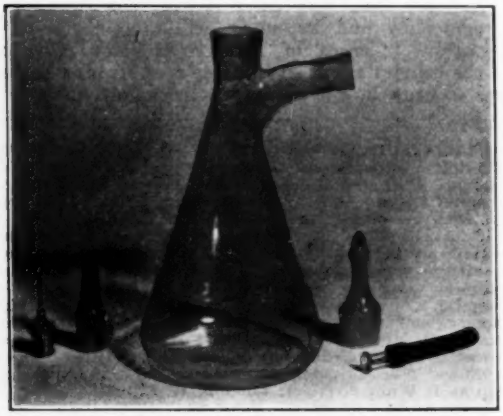
It consists of a conical flask made of Monax resistance glass and having a capacity of 500 c.cm. This has two necks, both of which are ground and fitted with canalised stoppers. The stopper fitting into the lateral neck is ground to take the needle. The stopper fitting into the vertical neck is drawn out into a short tube, which is plugged with cotton-wool and carries a short piece of rubber tubing with a lip-piece. The needle is short-bevelled and wide-bored (14 B.W.G.), and both outer and inner surfaces are polished. It must be perfectly sharp.

For ordinary venesection it is sufficient to keep the flask filled with phenol solution until required and simply to boil the lateral stopper and needle immediately before use. A small quantity of citrate solution will retard clotting and facilitate subsequent cleaning. If required for taking sterile blood the apparatus is sterilised in the following way.

The flask is washed out with saline, and the apparatus is assembled with the exception of the needle. A test-tube (6 × 1 in.) is placed over the lateral neck and sealed with a cotton-wool collar, and the apparatus is then autoclaved. The needle after being separately sterilised by boiling is fitted immediately before use, and the test-tube is replaced.

The band of a sphygmomanometer is placed round the upper arm and filled with air to a pressure of

FIG. 1



80–100 mm. mercury. After sterilising the skin of the antecubital fossa an intracutaneous injection of 0·2 c.cm. of 2 per cent. novocain is made over the vein selected. The flask is held more or less upright in the right hand with a "revolver grip," and the needle is rotated if necessary and introduced into the vein. The blood is then allowed to flow into the bottle. Aspiration is seldom required, but may be employed by sucking the mouth-piece if the flow becomes impeded. (It usually requires 5 to 10 minutes to obtain 400 c.cm. of blood.) After use, if the blood is required in a sterile condition the sterile test-tube with its cotton-wool collar is replaced over the needle and lateral stopper, and the apparatus removed to the laboratory for separation of serum.

FIG. 2

The advantages which this apparatus seems to possess are:

(1) The ease with which the needle can be introduced. The system is a rigid one, and as there are no rubber connexions it can be controlled by one hand. No assistant is necessary.

(2) That serum may be quickly obtained in a sterile condition, and can be separated from the clot by pouring through the lateral neck, the clot being subsequently cleared out through the wide vertical neck. Nearly fifty bleedings of 200–400 c.cm. have been taken in succession without contamination, and with the minimum amount of complaints of pain or discomfort from the donors.

This apparatus was devised originally for removing serum for measles prophylaxis, but it has proved so popular for ordinary venesections among house physicians that we thought it worth while publishing the description. Since the flask cannot be shaken while the blood is being withdrawn it is not suitable for obtaining citrated blood. The apparatus can be obtained from C. Dixon and Co., 27, Devonshire-street, W.C.1.

A CASE OF NARCOLEPSY

By E. Mildred Creak, M.D., M.R.C.P. Lond., D.P.M.
ASSISTANT MEDICAL OFFICER, MAUDSLEY HOSPITAL, LONDON

NARCOLEPSY is no longer regarded as a rarity, but in the following case the patient was unusually young and presented some of the less common features besides the two associated forms of attack first described in 1880 by Gelineau—namely, periods of excessive and irresistible sleep, and the so-called cataplectic attacks, usually the result of hearty laughter or other emotional stimulus.

HISTORY

A girl, aged 7, first attended the Maudsley Hospital in February, 1932. For the previous seven months she

had been noticed to fall asleep at any hour of the day, in addition to having her ordinary sleep at night. Her parents were interrogated separately on different occasions, but both described another feature of her illness, which they proffered apologetically, as if they might be accused of exaggeration. The father said: "It's a funny thing; when she laughs her legs seem to buckle up under her." The mother described it as: "When she laughs she goes a bit sillified and falls over."

The *family history* has been investigated at some length and no cases of epilepsy are recorded on either side over three generations. The parents are both healthy, the father being of poor mentality but a steady worker. Their eldest child died at three of diphtheria, the second in infancy of broncho-pneumonia. The third child had "epileptic fits," but only survived birth for 37 hours. Of the living siblings, two are older and one younger than the patient. Two of these have suspected tuberculous adenitis, and attend open-air school.

The *early history* is uneventful, although the mother had rheumatic fever during this pregnancy, and the child was born frail. Her development was normal, and of children's complaints she has had whooping-cough, measles, and chicken-pox. She is subject to ordinary colds, but there is no history of influenza or of any other febrile attack of doubtful nature; in short, nothing that could be identified as an attack of encephalitis lethargica.

Until the time of the present illness, her behaviour with other children and her progress at school were regarded as normal. Official notice of her illness came first from the school authorities, her teacher observing that the child fell asleep over her work. On another occasion she fell asleep during school assembly, and slept soundly for two hours when put to lie down. At this time the question was raised as to whether the child was getting enough sleep at night, and it was then noted that since the onset of her illness she had been restless in her sleep, and had said that she was afraid to sleep, because, as soon as she closed her eyes, she saw a man running after her or a tram coming to run over her.

It was ascertained that at home as well as at school the child frequently fell asleep, especially during or immediately after a meal. The attacks occurred especially if she were not actively engaged in play; but she had been noticed to sway, and drop what she was holding, and after this would always go to a chair and fall asleep. From this sleep she could easily be roused, but if she were so would become irritable and abusive. Otherwise she was described as friendly and affectionate.

PHYSICAL EXAMINATION

On admission she was thin and somewhat neglected-looking, shy, but not abnormally so, and she was small for her age, but no more below average height and build than are both her parents. She gave a normal score on the Burt revision of the Binet-Simon tests, but was noted to drowse off twice during the testing. On physical examination it was noted that the left pupil was larger than the right, and that this slight inequality was maintained, although both reacted to light and accommodation. The eye movements were normal, and nothing pathological was seen in the fundi. No other physical signs were found in the nervous system, and there was no evidence of disease elsewhere. The Wassermann reaction was negative, and a skiagram of the sella turcica normal.

ATTACKS IN HOSPITAL

During her first month in hospital she remained in bed and frequently was found asleep. But she appeared to be happy and in good health, was apyrexial, and would always be easily roused from her sleep. She amused herself, reading, playing, or knitting. Occasionally after laughing she was noted to have a fixed expression, with half-closed lids, and her mouth half-open in a rigid smile. Such a pose was always fleeting. On another occasion when sitting in a chair, and talking about what she had had for dinner, she suddenly appeared "far away," her eyes half-closed, and her head fell partly forwards with her chin towards her chest. Her pupils were noted to contract, and her expression was one of complete preoccupation. The whole attack lasted 10–15 seconds, and she rather suddenly resumed her conversation where she had broken off.

At night she slept for eight or ten hours, but was restless in her sleep, and frequently talked or called out "don't! don't!" as if afraid. In the morning she failed to remember her dreams, and there was never sufficient disturbance of her sleep to wake her up.

She was then allowed up, and on April 25th occurred the first emotional outburst. She was carried in from the garden because she refused to come in of her own accord; at this she kicked and screamed, scratched the nurse's face, and swore vehemently. The same evening another attack occurred, on similar provocation, and for the next two days she was found many times asleep, huddled on a chair. On being put to bed she slept soundly for the greater part of another day. Ten days later her first (and only) cataplectic attack seen in hospital occurred. She was laughing loudly in the ward, when she suddenly "fell limp in a heap on the ground." On this occasion she could not be immediately roused, and was lifted on to a bed, where she recovered within a minute of the attack beginning. Unfortunately no medical officer was present, and therefore no examination of the nervous system was made. After this attack she slept for the rest of the evening and night. On many other occasions she has been noted to laugh heartily without such an attack resulting.

Since then there have been several less severe outbursts of temper, and after screaming she appears limp and exhausted, and her chin trembles as if her teeth were chattering, and her limbs shake as if with cold. There are otherwise no associated physical signs with these attacks of rage. The paroxysms of sleep continue, but much less frequently, and it is now (five months after admission) rare to find her asleep with her head on the table—formerly a common occurrence at meals. She was recently, however, found asleep in the lavatory, and on another occasion was noticeably drowsy after breakfast. On the latter occasion her pupils were again unequal, the left larger than the right, and not perfectly central. Both pupils again reacted, but somewhat sluggishly, to light and accommodation. Apart from this single observation, the pupils have been observed equal since a month after admission. There are still no other signs of disease in any system; her appetite and fluid intake are regarded as normal, but she has gained 13 lb. in weight in 22 weeks, until now, although short, she is distinctly above average weight. The distribution of fat, and her general appearance are not, however, suggestive of pituitary disorder, and it is now proposed to treat her with small doses of thyroid, a method which has appeared to be successful in several cases reported by Weech [1] and others.

A complete survey of the published cases has been made by Max Levin,[2] and of all these only four are reported in which the age of incidence is under ten years. Of these, Weech's case is similar in his description of sleep disturbed by bizarre dreams, a feature commencing only with the illness, as in this case, while another of Max Levin's own cases (No. 6) had "disturbed sleep." Jacobssohn [3] describes his case as being "healthy until 6 years of age," and he notes transient pupil changes occurring in sleep, with myosis at the onset, mydriasis in deep sleep. Strauss [4] reports a case with "irregular oval pupils," but in an adult post-encephalitic patient. Wenderowic [5] describes a case in an adult in which tremor of the jaw occurred, and this was regarded by him (and the patient) as larval or abortive cataplectic attacks.

There appears little doubt that the cataplectic attacks occur more commonly after laughter than after rage, a point emphasised by Kinnier Wilson,[6] Adie,[7] and others, and Levin noted only five cases in the literature with such attacks occurring on rage alone. In this case the only complete cataplectic attack occurred after laughter, but other manifestations, such as the tremulous jaw and shaking limbs, are commoner after rage. This, together with the early age of onset, and the transient pupillary changes without discoverable lesions, are features not individual to this case, but among those less commonly reported in the literature.

I am indebted to Dr. E. Mapother, medical superintendent of the Maudsley Hospital for permission to publish these notes.

REFERENCES

1. Weech, A. A.: Amer. Jour. Dis. Children, 1926, xxxii., 672.
2. Levin, M.: Arch. Neurol. and Psychiatry, 1929, xxii., 1172.
3. Jacobssohn, E.: Klin. Woch., 1927, vi., 1241.
4. Strauss, H.: Zeit. f. d. ges. Neurol. u. Psychiat., 1927, cix., 401.
5. Wenderowic, E.: Arch. f. Psychiat., 1925, lxxii., 459
6. Wilson, S. A. K.: Brain, 1928, li., 63.
7. Adie, W. J.: Ibid., 1926, xlix., 257.

BRITISH MEDICAL ASSOCIATION

CENTENARY MEETING IN LONDON

SECTION OF SURGERY

IN this section on July 28th, with Lord MOYNIHAN, the President, in the chair, a discussion on the indications for and results of

Removal of the Spleen

was opened by Lord DAWSON. There were, he said, apart from cases of trauma and of rare tumours, only three diseases in which splenectomy was justified—namely, acholuric jaundice, purpura hæmorrhagica, and splenic anæmia. The spleen might be described as a concentration of reticulo-endothelial tissue, but on removal its function could be taken over by other organs. Unless there were special reasons, he believed that all cases of acholuric jaundice should have splenectomy performed, though not before the age of 12 years. After that age he favoured operation as early as possible; the risks were less in young subjects because fewer adhesions had formed. The fact that jaundice was absent or the patients were apparently well was no reason against splenectomy. They were only well at the expense of over-activity of the bone-marrow, and blood examinations often revealed that in spite of apparent health a definite anæmia was present. The risks of not operating were, he considered, greater than the risks of operation. Acute anæmic crises were always liable to occur while the spleen was retained, and if there was severe infection of any sort, the anæmia might become so severe that it was too late for surgical interference. Jaundice he found usually present in early life. It might then be lost and the patient might subsequently reappear with severe anæmia and no jaundice, rendering diagnosis difficult unless a careful history was obtained. The presenting features were in no way constant, and he had seen cases where there was no jaundice, others where the spleen was not involved, and others where the fragility of the red blood-cells was normal. Gall-bladder involvement he believed to be a common complication. If the splenic adhesions were not severe and the patient's general condition was good, he advised dealing with the spleen and gall-bladder at the same operation; when two operations were necessary he advised splenectomy first. The question of preliminary transfusions was important. In spite of the greatest care in matching the bloods he had seen disastrous results following transfusion, and on the whole he considered it contra-indicated.

In purpura hæmorrhagica he had found the results of splenectomy equally good, but correct diagnosis was extremely important. There was usually a history of bleeding and on examination there was found to be a delay in clot retraction, though not in coagulation time, due to lack of platelets. Blood transfusion resulted in an acute rise of platelets and should therefore be employed before operation.

The PRESIDENT, having briefly outlined the history of splenectomy, discussed its value in splenic anæmia. Gastric hæmorrhage, he said, was often a presenting symptom leading to a diagnosis of gastric ulcer. Since the condition was always fatal if the patient lived long enough, he believed operation should be undertaken at all stages, though early operation was desirable. The presence of ascites and cirrhosis of the liver he did not think contra-indicated operation. The greatest technical difficulty of the operation was the presence of adhesions. He emphasised the necessity, however, of careful preparation of the patient. Splenectomy for this condition should never be performed as an emergency. Two or three months were well spent in reducing the size of the spleen by radium or deep X ray therapy, and in raising the red blood count by transfusions. He had reduced his mortality from 12 per cent. to 6 per cent. Acholuric jaundice, he thought, was of two types, congenital and acquired. The common complications in cases not operated upon were anæmic crises and common-duct obstruction by stones. Mortality he had found due to the preventable complications of the disease. Operation did not cure, but prevented such complications. Purpura hæmorrhagica he classified as acute and chronic, the latter giving no cause for anxiety at operation. It was essential, he said, to differentiate the condition from aplastic anæmia and hæmophilia.

Dr. J. W. MCNEE (London) said that, apart from purpura, cases in which splenectomy was indicated showed splenomegaly. The patient might seek advice because of the bulk of the spleen, for pain arising from perisplenitis, for anæmia, for recurrent jaundice, or for hæmatemesis, or the enlarged spleen might be found by accident during a general overhaul. Conditions in which he considered splenectomy contra-indicated were infective endocarditis, Hodgkin's disease, Addisonian anæmia, and the majority of leukæmias. He classified the splenomegalias of unknown ætiology as splenic anæmia due to a primary lesion of the spleen, and anæmia associated with splenic enlargement dependent upon a primary hepatic cirrhosis. At present it was impossible to distinguish clinically between these two groups. It was often extremely difficult if not impossible to distinguish clinically between other enlargements of the spleen, although the underlying pathological lesion might be very different, as in Gaucher's disease, reticulo-endotheliosis of the spleen, and conditions where there was great fibrosis. Splenectomy in splenic anæmia, he believed, offered the only chance for the patient, and he considered no case too desperate for operation, even though severe ascites was present. In cases where very dense adhesions were present he advised ligation of the splenic artery rather than removal. Late thrombosis and repeated hæmatemesis he had found the most dangerous immediate complications. In many cases the blood count returned to normal, in others slight anæmia persisted. He had found no evidence that splenectomy lowered the resistance to infection.

Sir FRANK CONNOR (Bombay) analysed figures for the cause of splenomegaly in different parts of India, and concluded that the most important class from the surgical point of view was that of "splenic anæmia" of unknown ætiology, some possibly post-malarial or post-kala-azar.

Prof. D. P. D. WILKIE (Edinburgh) said the complications of splenectomy were hæmorrhage, partial thrombosis, and chest complications. In doing 42 splenectomies he had not had any trouble from adhesions. He considered the results were good in hæmolytic icterus, especially in cases with a high reticulocyte count and in purpura, but not so satisfactory in splenic anæmia, especially if the initial platelet count was above normal when post-operative thrombosis was a likely complication.

Mr. A. J. WALTON (London) thought it was helpful to use the functions of the spleen as a basis of classification of enlargements. He instanced the part it played as a reservoir in parasitic infections and said he had seen improvement after removal of malarial spleens. He also thought that, especially in tubercle of the spleen in children, for example, it might form red cells leading to polycythæmia which was relieved

by splenectomy. It also destroyed red cells as in splenic anæmias, the majority of which were relieved by splenectomy. He had seen a few cases of pernicious anæmia definitely relieved by splenectomy.

Dr. H. P. GILDING (London), discussing the physiology of the spleen, said that its function was to act as a reservoir for red cells, white cells, and platelets, and it also provided reticulo-endothelial and lymphoid tissue. Since splenectomised animals were less able to resist coal-gas poisoning than those with their spleens intact, it was possible that in various asphyxial states the spleen was of practical importance in man, because of its power of acting as a reservoir.

Prof. ALI IBRAHIM PASHA (Cairo) described the clinical picture associated with bilharzia infection and splenomegaly, which was extremely common in certain districts in Egypt. He performed as many as 100 splenectomies a year for the condition. Clinical improvement was great and could not be obtained by any other means, and the mortality in expert hands was lower than 6 per cent.

Prof. STANLEY DAVIDSON (Aberdeen) emphasised the difficulty of diagnosis in obscure anæmias with splenomegaly. He suggested it was often difficult to make a differential diagnosis between idiopathic microcytic anæmia and splenic anæmia. Both responded to massive iron dosage. He said there was a large group of hæmolytic anæmias other than acholuric jaundice and made a plea for adequate statistical analysis of the results of splenectomy.

Dr. DOROTHY HARE (London) emphasised the importance of recognising that splenomegaly might be a symptom of idiopathic microcytic anæmia. She thought the absence of a leucopenia in this condition, the typical small red cells, and its occurrence in middle-aged women as opposed to young people of both sexes served to differentiate it from splenic anæmia.

Prof. A. W. SHEEN (Cardiff) suggested that splenic anæmia was a symptom-complex rather than a disease, and instanced cases of congenital syphilis and tubercle producing a similar picture. A guarded prognosis should, he thought, always be given when cirrhosis of the liver was found at operation.

Dr. A. R. PARSONS (Dublin) demonstrated by means of lantern slides a series of patients with acholuric jaundice who throve and multiplied though splenectomy was not performed.

Dr. S. D. FREER described the case of a man whose spleen he had removed for rupture in 1910, and who had been found at operation in 1920 to have a spleen normal in size and appearance.

SECTIONS OF PATHOLOGY AND BACTERIOLOGY

AT a combined meeting of these sections held on July 29th the chair was taken by Capt. S. R. DOUGLAS, Vice-President, and Prof. J. C. G. LEDINGHAM opened a discussion on

Tissue Changes in Virus Infections

He emphasised the importance of the details of the tissue-parasite reaction between host and parasite, the early stages of which were still obscure. He defined viruses as living organisms only different from bacteria in their size, which might be almost as small as a molecule of hæmoglobin or as large as the limits of microscopical vision. There was a group just big enough to be stained and seen, and the study of these would be very helpful. Cell-inclusions were valuable in understanding virus diseases, but no less interesting were necroses and inflammatory and degenerative phenomena. Gross lesions in the pock diseases were rare in the organs, but there were notable differences in the mode of attack on the skin. In vaccinia and small-pox the lesion was in the vascular tissue of the dermis and the epithelial cells were not primarily attacked, though in fowl-pox the lesions had by some workers been regarded as primarily epithelial. The pock viruses offered excellent examples of inflammatory skin lesions, while in yellow fever the lesions were fatty degenerations, necroses, and necrobioses in liver, kidney, heart, and spleen, with little or no inflammatory response. The nervous lesions fell into two groups: in one there was meningitis with little, or only secondary, encephalitis—e.g., herpes and vaccinia—and in the other the neurones were chiefly affected—e.g., rabies and poliomyelitis. Inflammatory changes undoubtedly accompanied degeneration, and might be primary or secondary. In some virus diseases, such as distemper and fowl plague, there was a lack of any gross tissue changes, but accurate histological investigation was very desirable. Proliferative lesions like the Rous sarcoma could also be produced by filtrates. Warts had been much studied, and the virus was filtrable and extraordinarily specific. The essential lesion of the dog-wart seemed to be the layer of enlarged clear epithelial cells with increase of cytoplasm and nucleus, overlying a normal Malpighian layer. Cytotropisms were manifested in these diseases. The virus of poliomyelitis reached the nerve-cells by way of the axis-cylinders, the primary attack being on the nerve-cell, and the louping-ill virus had a particular affinity for the Purkinje cells. A change of host or a method of propagation might profoundly alter the pathological picture associated with a virus and bring to light unexpected tissue affinities. The study of cell-inclusions had withdrawn attention from the tissue changes. Viruses were not essentially intracellular parasites; the penetration of cells was an accidental event in the wide proliferation of the parasite. The only difference between virus and bacterial invasion was the failure to sort out the tissue reactions from the invasion phenomena.

Prof. E. PASCHEN (Hamburg) said that the ætiological agents of the pock diseases were the "elementary bodies" of Borrel; minute coccoid corpuscles which divided into two dumb-bell shaped parts and were always to be found in enormous quantities. They measured from 0·2–0·25 μ. Presumably the Paschen bodies had a lipoid membrane and could resist drying, thus being difficult to stain. They could be demonstrated in large numbers in infant and cow-pox lymph, in variola vera, varioloid and alastrim, and also in inoculated pox and in metastatic lesions in the skin and organs after inoculation with neurolapine. He felt justified in saying that the Paschen bodies were the ætiological agents of variola vaccine. In the course of evolution three strains had developed: human, fowl, and cow, the common source probably being man. Many pock infections were transitory and could not be transmitted. The most marvellous experiment in the realm of medicine had been brought about by Nature in primæval times, when she had transformed the aerially contagious virus of *Variola humana* through the cow or horse into the non-contagious vaccinia phase. It was impossible to explain variola inoculation without postulating a septic focus in the lungs from which the blood was suddenly flooded. The mucous membrane of the mouth was damaged by the droplet infection, and so the focus developed. Vaccinia was different; there was only a bacteræmia, and the virus circulated with a minus variant which could be in part experimentally removed by forcing the virus to accustom itself to a strange environment or

a high temperature. The neurovaccine or neurolapine so produced was very like variola. It produced characteristic necroses, hæmorrhage, and metastasis; it affected the mesenchyme as well as the epithelium; the lesions were unlike anything else; they were sterile and they contained virus. Neurolapine caused changes in the lung but dermolapine did not. Vaccinia attacked all three primitive layers, while cow-pox attacked only the ectoderm and perhaps to some extent the endodermic epithelium.

Five factors were concerned in inclusion bodies: (1) phagocyted leucocytes; (2) extruded nuclei; (3) protruding chromatin; (4) lesions in the plasma; and (5) cap-shaped lesions in the nuclei. Guarnieri bodies consisted of masses of Paschen bodies.

Without exception, cell inclusions in small-pox of the chick showed a lipoid component never seen in variola.

Dr. J. PERDRAU (London) spoke of the reaction of the microglia in virus diseases of the nervous system. The characteristic lesion was degeneration of the myelin sheath and mobilisation of the microglia, which engulfed the products of degeneration and underwent certain changes. The microglia did not necessarily undergo this acute reaction when fat had to be removed as a result of degeneration; the process might take place quite slowly. Probably a particular form of lipoid which stimulated the microglia was absent in the other diseases where the reaction was not seen. In the demyelinating diseases the white matter was chiefly involved, and the response of the microglia was very rapid indeed.

INCLUSION BODIES

Dr. S. P. BEDSON (London) said that the inclusion body when present had differential significance. The cytoplasmic inclusion bodies in vaccinia, fowl-pox, and ectromelia were masses of elementary bodies embedded in a jelly-like matrix—in effect, virus colonies. The nuclear inclusion bodies were more obscure and were of two types: in one type small acidophilic bodies coalesced to form a mass separated by a clear space from the nuclear membrane with margination of the chromatin; this type was seen in herpes and varicella. The other type seemed to arise from the nucleolus, and was less acidophilic and had definite basophilic edging; these were seen in mouse livers. Inclusions had never been produced experimentally, except by means of a filtrable virus, and mouse liver, salivary gland, and rat kidney inclusions had been proved to be associated in normal animals with the presence of a filtrable virus.

Dr. G. M. FINDLAY (London) said that the only classification of ultra-microscopic viruses available was that based on clinical symptoms and tissue changes. A group with ectodermal affinities, and another with neurotropic affinities could be distinguished, and a third group comprising sand-fly fever, dengue, yellow fever, and Rift Valley fever. What was known of dengue tissue reactions suggested that they resembled those of yellow fever and Rift Valley fever. In these conditions the main brunt of the attack fell on the liver, which showed extensive midzonal necrosis and fatty degeneration, an eosinophilic change in the cytoplasm, many acidophilic intranuclear inclusions and polymorphonuclear and mononuclear infiltration. In man there was less leucocytic infiltration, fewer inclusions, and more hyaline degeneration of the cytoplasm and nucleolar hypertrophy. In Rift Valley fever similar changes were seen, but no cell inclusions, and the toxic changes were less marked. If it was transmitted to sheep, however, it was fatal, and the degenerative and necrotic changes were found. Yellow fever was not transmissible to other animals, except by intracerebral inoculation in mice, producing a fatal meningo-encephalitis, the virus being found only in the central nervous system and adrenals. After repeated passage through mice the virus would only infect monkeys if inoculated intracerebrally. No such modification or neurotropic tendency had been seen in Rift Valley fever. Some clue to the origin of the tissue changes might be found in guanidine metabolism; in both diseases the liver cells were probably attacked by the virus, with an increase in blood guanidine and decrease in blood-sugar.

Dr. I. A. GALLOWAY said that rabies, poliomyelitis, and Borna disease undoubtedly showed elective affinities for certain tissues. The viruses travelled along the nerve-fibres centripetally or centrifugally. For successful inoculation into a nerve the axis-cylinder must be damaged. The passage caused a reactive infiltrative interstitial neuritis. The virus of rabies could be recovered from the sciatic nerve as early as the fifth day after intracerebral inoculation. In Borna disease the neuritis was more intense, perhaps because of the longer period between inoculation and the appearance of symptoms. The characteristic Joest Degen intracellular bodies had been demonstrated wherever nerve-cells were found in the body. Borna disease was very similar to poliomyelitis in man, and the portal of entry was probably similar. The neurones were primarily attacked, and the virus travelled throughout the body exclusively by the nerve-fibres.

Dr. R. W. FAIRBROTHER (Manchester) said that the virus of poliomyelitis showed a marked tissue selectivity; it was strictly neurotropic, and produced lesions in human beings and monkeys only. The infection had been studied on 600 monkeys. The virus had not been found in the cerebro-spinal fluid at any time in the development of the disease. During the incubation period the virus had only been demonstrated round the site of inoculation; during the early preparalytic stage lesions had been seen in the cervical and lumbar enlargements, where the virus could often be demonstrated, and in the mid-brain and pons. The virus seemed to pass principally by the axis-cylinders. The incubation period seemed to represent the time taken to reach the nerve-cells, and the preparalytic stage was the early reaction between nerve-cells and virus. The first lesions were nerve-cell degeneration with or without perivascular infiltration of the central vessels. Later there were nerve-cell neuronophagia and perivascular and meningeal infiltration. The essential lesion was destruction of the nerve-cells, chiefly those of the anterior horn of the cord. Intranuclear inclusion bodies were seen in degenerating nerve-cells, but did not represent the actual virus, as they measured 4-5 μ.

Prof. L. ASCHOFF (Freiburg) said that inclusions had been found in the salivary glands of stillborn infants, whose mothers had been healthy. There must be an infection through the mother to the child. There must be many intracellular and intranuclear infections. In cancer the "inclusion bodies" were not true ones; they were the result of phagocytosis.

Cancer and Tuberculosis

Dr. THOMAS CHERRY (Melbourne) described his experiments showing that the inoculation of very small doses of virulent tubercle bacilli beneath the cuticle of the mouse is followed by a large increase in the incidence of tumours. The site incidence of these tumours was very similar to that found in human beings, whereas the spontaneous tumour of the mouse was usually found in the mamma, and sarcomata

were rare in that animal. The significant figures relating to 1200 mice equally divided into inoculated and controls were as follows :—

Epithelial tumours	..	57	in inoculated,	7	in control mice.	
Sarcomata	.. ..	31	,, ,,	5	,, ,,	,,
Ulcers near the pylorus		40	,, ,,	5	,, ,,	,,

About 14 per cent. of the epithelial tumours had secondary deposits in the local or distant lymph glands, and a spindle-celled sarcoma was shown which on transplantation had produced similar nodules in the surface of the peritoneum of the second mouse. Other sarcomata had secondaries in the liver and lymph glands. A similar tumour growing in the inguinal region was emulsified and injected into five guinea-pigs, one of which died a year later with well-marked chronic tuberculosis.

Among the lantern slides shown with this paper were examples which Dr. Cherry said were rare or perhaps hitherto undescribed in the mouse, such as papilloma of the bladder, duct carcinoma of pancreas with secondaries in a lymph gland, and a carcinoma of the lung merging into an oat-celled tumour of the glands at the bifurcation of the trachea. The ulcers near the pylorus constituted a new feature in experimental pathology. They appeared to form a series presenting all types from innocent to malignant, and the evidence that they had been caused by the inoculations was strengthened by the fact that ulcers and tumours were usually associated with lymphocytic infiltration of the surrounding tissues. One mouse showed an apparently malignant condition of the epithelium at the pylorus, and similar appearances in the adhesion to the pancreas, the local lymph glands, and the liver. In another instance, the suspicious-looking epithelium at the margin of the ulcer was reproduced in an adhesion to the liver. Dr. Cherry did not claim that the tubercle bacilli were the direct cause of these lesions but that they may act as a chronic internal irritant in the mouse. They excited an intense lymphocytic reaction, and the lymphocytes probably formed the connecting link between the bacillus and the onset of malignancy.

Prof. C. H. BROWNING (Glasgow) suggested that there might be some factor other than the mouse and the tubercle bacillus. In very long experiments with mice and tuberculosis he had never seen tumours to such an extent as to suggest any causative relationship.

Dr. FINDLAY asked if Dr. Cherry had considered hair-eating as an ætiological factor in the ulcers. It was doubtful whether those lymphoid growths were true cancers ; they had recently been transplanted in very closely interbred mice, producing leukæmia. The interbreeding in Dr. Cherry's series might be a factor in the production of these growths.

Mr. SAMPSON HANDLEY (London) thought the inverse ratio between tuberculosis and cancer must be of fundamental importance. Lymphocytic infiltration was a constant result of lymphatic obstruction, which was probably the cause of cancer. Dr. Cherry had given a new direction to cancer research.

Prof. M. J. STEWART (Leeds) thought that a number of Dr. Cherry's epithelial growths would not be generally accepted as carcinomatous.

Dr. CHERRY, in reply, said there was no probability of the ulcers being caused by hair balls, for none had ever been found in the pyloric region of the stomachs of these mice. On the other hand, they were always associated with the lymphocytic adhesion which formed between the pancreas and the wall of the pylorus. In reply to Prof. Browning he said that the difference in technique probably accounted for the difference in their results with tubercle bacilli. He used very small doses and placed them in a non-vascular tissue in order to avoid arousing the defensive mechanism of the animal.

SECTION OF PHARMACOLOGY

AT the first session of this section, the President, Prof. J. A. GUNN, being in the chair, a discussion on the

Serum Treatment of Pneumonia

was opened by Dr. R. CECIL (New York). He proposed, he said, to consider only pneumococcal infections, which appeared clinically as lobar pneumonia. This work, which he had started ten years ago, was complicated by the existence of 33 different biological types of coccus, each possessing a polysaccharide substance on which depended their specificity and virulence. In New York three types alone accounted for about two-thirds of all the cases. Thus the incidence of Type I., which was the commonest and fortunately the most amenable to treatment, was 32 per cent. ; of Type II., 23 per cent. ; of Type III., 11 per cent. ; and of Type IV., which was the aggregate of all the other less common groups, 34 per cent. Type IV. cocci were found in the throats of normal adults, and were responsible chiefly for the infections in children. This distribution probably held good for country districts as well as for the towns. Statistics for the Bellevue Hospital, which cared for the poorer classes, showed a mortality of 28 per cent. for Type I., 48 per cent. for Type II., 42 per cent. for Type III., and 31 per cent. for Type IV. Cole, in 1912, had prepared an antiserum by which he had reduced the mortality of Type I. by half, and had induced an early crisis in many cases, but the serum did not find general favour owing to the technical difficulties attendant on its use.

In 1921, said Dr. Cecil, he had set out to overcome these difficulties. There had been little agreement on the supposed strength of the Felton serum which he was using, but he was of the opinion that it was about eight to ten times as strong as the natural product, which reduced the dose to the reasonable figure of 20 c.cm. Though this serum was not liable to give rigors he had each patient's sensitivity tested by the skin and eye reactions ; the latter was a coarse test, and if positive definitely ruled out the use of serum. A first dose of 5 c.cm. was given slowly into a vein, followed up by more until 20 c.cm. had been given in the first day. This was repeated again on the third day to prevent relapses. The effects of the use of Type I. serum (illustrated by mortality tables and temperature charts) showed a reduction in the death-rate from 31 to 20 per cent. in treated cases. This group included all those admitted to the hospital, and each alternate case was taken as a control. When early cases only were counted the reduction was from 26 to 11 per cent. The crisis occurred up to two days earlier than expectation. The death or recovery of the patient was heralded by the appearance of cocci or immune bodies in the blood stream. The results in Type II. infections were more equivocal. It was only lately that a potent serum had been prepared, so that his series was still too small to be used as a proof, but the apparent fall in the death-rate had encouraged him to continue the trial. The temperature tended to fall by lysis in the treated cases when antibodies could be demonstrated in the blood. Hitherto it had been impossible to make a Type III. antiserum, and he did not expect that one would be prepared in the near future. In conclusion, Dr. Cecil said he had no doubt of the effectiveness of Type I. serum, which was both simple and practical in use.

Dr. J. A. RYLE (London) said he spoke as a critic rather than as an authority; he wished to stress the difficulties of therapeutic experiments in man, which were increased in these investigations by the very inadequate knowledge of the natural course of pneumonia. The mortality was lower in Britain than in the States, being under 20 per cent. for hospital cases, and presumably lower in those treated at home, and of those that did die only a small proportion could have benefited by Type I. serum. Weighing these considerations against the cost, the uncertainty, and the possible unpleasant complications of serum treatment, he could not agree to its general use, but appealed for a new study of the prognostic signs of pneumonia, which was an essential preliminary to the rational use of serum in general practice.

Prof. STANLEY DAVIDSON (Aberdeen) said that in his experience the type morbidity varied both in time and place apart from the periodic epidemics of Types I. and II. infection. This necessitated the preliminary typing of every case. Though fortunately placed for the study of pneumonia, since in Scotland it was a notifiable disease and in Aberdeen most cases were treated in the municipal hospital, yet he had not been able to collect the abundant and accurate statistics which he said were necessary for independent proof. The figures which he showed agreed with Dr. Cecil in the reduction of mortality and hastening of the crisis.

Prof. D. MURRAY LYON (Edinburgh) presented the opinions of the physicians of the Royal Infirmary at Edinburgh who had collected a small but carefully controlled series of cases suggesting the good effects of Type I. serum. They were firmly convinced that there was an improvement in many cases which their figures could not show. He recommended the immediate use of serum in those patients who could afford it, without waiting for the lengthy process of typing.

Dr. R. R. ARMSTRONG (London) described a rapid method of typing. He mixed a specimen of sputum with Type I. antiserum on a slide, which made homologous cocci plainly visible under a dry objective. The indiscriminate use of antiserum was therefore unnecessary. His figures showed a shortening of the pyrexia in treated cases, which he pointed out would be a great saving to hospitals.

Dr. R. CRUICKSHANK (Glasgow) was unconvinced by statistical proofs, but would respect the dictum of an experienced clinician that antiserum and oxygen should be at hand in every hospital for the treatment of pneumonia. Apart from treatment, the knowledge of type infection was essential for accurate prognosis. His graphs showed the epidemic incidence of Types I. and II. each winter, and the increasing frequency of Type II., so that he would welcome an efficient Type II. serum to combat this infection which was both common and fatal in patients under 30 years old in this country.

Dr. R. A. O'BRIEN (Beckenham) discussed the standardisation of the antiserum. He pointed out that it was impossible to be accurate using mice, but that the flocculation test was very good except when used with concentrated serum. Felton's serum was about ten times as strong as the natural product. Hitherto the strength of the unit had varied with the method of estimation, but it was hoped that this inconvenience would soon be remedied by the dry stable standard which had been prepared.

Dr. G. J. LANGLEY (Manchester) confirmed Dr. Cruickshank's opinion that Type II. pneumonia was prevalent, and pointed out that late serum treatment could not be expected to cure pneumonia any more than the late use of antitoxin could cure diphtheria.

Dr. CECIL in reply gave further details of technique.

Prof. V. E. HENDERSON (Toronto) read a paper on the

Mechanism of Salivary Secretion

In 1921 Loewi had shown that a substance like acetyl choline could be extracted from the heart after vagal stimulation. Mr. M. H. Roepke and he had made a similar investigation into the properties of the chorda tympani nerve. The method employed was to stimulate a cat's denervated salivary gland with physostigmine, and to estimate the presence and quantity of acetyl choline produced by the depressor effect that the perfused fluid had on a frog's heart. Tracings were shown to illustrate this. Acetyl choline did not appear in the presence of free atropine. It was not easy to show whether or not salivary secretion could be stimulated in an atropine blocked gland, but he thought that the continued vasodilatation that occurred was due to the production of acetyl choline. The technical difficulties were enhanced by the ease with which acetyl choline was produced from its precursor in poorly oxygenated tissues, and the rapidity of its hydrolysis in a stimulated gland.

Prof. F. R. FRASER (London), Prof. A. J. CLARK (Edinburgh), the PRESIDENT, and Prof. R. ST. A. HEATHCOTE (Cairo) discussed the paper.

SECTION OF MENTAL DISORDER

AT a meeting of this section, held on July 28th, the chair was taken by Sir MAURICE CRAIG, the President, and Dr. H. CRICHTON-MILLER (London) opened a discussion on

Mental Health in Relation to Education

He considered the relation of the teaching profession to the doctor in three phases: up to the beginning of this century the doctor had been the man who attended cases of sickness; then for a period he had been called on to advise on physical prophylaxis; and the ideal state would be one in which he was regarded as a health officer in every sense of the word, guardian not only of the pupils' well-being but also of their mental health. However obviously desirable the third state of affairs was, it was a fact that the doctor was less qualified than the teacher to cope with mental hygiene. The teacher had at least had some training in psychology. During the school years certain physiological, intellectual, and emotional adaptations were continuously in progress. The physiological adaptations were growth and sex development, and the standardisation in school life made excessive demands on those who were in any way freaks. For normal, average, or standard material there was great moral and physiological benefit in being treated exactly like one's neighbour, and having to adjust to the school. But for the abnormal child—e.g., the overgrown—an individualistic school was better. The enormously fat girl of 15 was something more than a school joke; behind that cheery good nature for which "Fatty" was notorious, tragedy was slowly evolving. The boy with an undescended testicle underwent torments of inferiority. There seemed to be two cardinal tenets among teachers in boarding schools: that no girl masturbated unless she was "quite abnormal" and that no boy masturbated unless he was "definitely vicious." Therefore the girl was taken to a specialist and the boy was dealt with as a delinquent; of the two measures the first generally

did less harm. Yet there was no greater opportunity than this for promoting sound character development nor yet one that was so consistently misused. A corresponding ineptitude was manifested in the problem of homosexuality.

Many people sent their children to school to pass an examination; the home emphasis was on intellectual achievement. But the child at school ought to acquire a general capacity to interpret and evaluate his own experience, and to learn a great deal about the logical consequences of his own actions. The whole range of school life comprised the great transformation from a pre-school child—dependent, loved, accepting, protected—to the young adult—independent, loving, giving, and protecting. At school the child was expected to make his herd adjustment while he was kept actively engaged on work and play and while physiological changes were going on within him of which he could not fail to be aware and by which he was often bewildered or terrified. It was not surprising that maladjustments occurred. They should be recognised at an early stage, and the medical officer ought to be the active partner of the teacher in coping with them. First indications in many cases were either excessive self-assertion or a withdrawing into a phantasy life. The real problem of dementia præcox was the prophylactic diagnosis and treatment of the early schizophrenic during his school life. Stammering was an important indication of a fault in emotional development. The time was ripe for the profession to recognise that the field of mental hygiene in the school was in urgent need of cultivation, in that it gave an opportunity for prophylaxis second to none in the whole extent of national health.

EFFECTS OF PHYSICAL FATIGUE

Dr. REGINALD MILLER (London) said that a child at school who became over-fatigued had little chance to right itself naturally. While a normal child became lethargic, a nervous child would become emotional and irritable and might cause an extraordinary amount of unhappiness by bullying and selfish habits. A child would never complain of being tired, but as the symptoms were first manifested in class, the school-master and mistress could not escape from the responsibility of recognising them. They were more likely to appear before the public school age. The nervous child had less reserves than the normal child, and felt strain more, especially if growth were rapid and physical health subnormal. The causes of bad health were often obscure—e.g., a chronic toxæmia with its source in the intestine, often unfortunately called "acidosis." Endocrine imbalance might be a factor, especially in adolescent girls who aggravated it by "slimming."

Speaking of the causes due to the school régime, Dr. Miller said that day-schools imposed more strain on children than boarding-schools; climate might be unsuitable. Children often had too little rest, apart from sleep, and continual noise was especially trying; a period of silent rest should be ordered daily and meals should be taken in comparative quiet. Hours of work were often far too long, and the nervous child, who must work at high pressure, came badly to grief. The quicker workers should have an extra 15 minutes' rest in every hour. Public examinations put a tremendous strain on children. Treatment of fatigue chiefly consisted of rest, adjustment of the school régime, and tactful individual handling.

Dr. R. H. CROWLEY (senior medical officer, Board of Education) said that the very fact that he should have been asked to speak marked a significant and rapidly developing change in the modern conception of medicine. During the last 30 years the school medical service had passed from treatment to prevention and from prevention to health and its maintenance; there was a growing conviction that the work of the school medical officer was not merely to deal with a few abnormal cases but to care for the mental health of all children. Attention was now being paid to the emotional manifestations of children. The Hadow Report and the Primary School Report marked the first occasion on which a Government report had put the whole process of education on a biological basis. School medical officers were learning how to recognise and prevent the conditions in school life which led to the prison, the reformatory, and the asylum. They would, however, have to acquire a more subtle appreciation of the different qualities in behaviour; the Commonwealth Fund had shown the difference of attitude to behaviour between teachers and psychologists. A psychological service in the school system would be of much service to doctor and teacher. The staff of a child guidance clinic, however small, must be expert and specially trained, preferably by a psychiatrist, who alone could deal with the whole child, including the mental health of the parents, the stock from which it came, and its life-history and circumstances. For the new understanding of the mental life of the child team-work would be necessary between the school medical officer, the psychiatrist, the psychologist, and the teacher. Little headway would be made until closer coöperation was secured between teachers and parents.

The BISHOP OF CHICHESTER defended the religious attitude as, from the psychological point of view, a good working philosophy. The church, by teaching it, could help to set a man on his feet amid the terrifying pace of modern life and give him a dynamic philosophy and mental health. He asked how the church could get the help of psychiatrists in dealing with those persons whose mental condition needed special measures of repair or training.

DEFECTS OF THE MODERN BOY

Mr. CUTHBERT BLAKISTON (Headmaster, Lancing College) said that educationists tended to get into grooves, to assume an "average" child—which did not exist—and to speak and think as though the "average" child of to-day were comparable with the "average" child of 15 or 30 years ago. There was an astounding contrast between the young people of the present day and those of 30 years ago, one so great that it was impossible to put them into parallel lines of comparison at all. In those days life had been much simpler and boys had been prepared to live calmly. The boy of to-day expected to be taken everywhere by motor-car; he had a gramophone and a wireless set, and so acquired his musical experience practically for nothing. His environment had affected his mental outlook disastrously; he craved for excitement, amusement, and high-speed travel, and feared loneliness and boredom. The boy born in the war years lacked the old spirit of adventure; his will was weak, he feared pain, he betrayed his comrades freely and lied without scruple, he worked and played feebly, and he loathed cricket. This lack of truthfulness was definitely associated with physical adolescence. Mr. Blakiston said that some boys definitely showed a kind of dual identity which he suggested might correspond with the concept "schizophrenia," and described "peacockery," a vanity which led boys to steal articles of personal adornment. These states of mind, which had not existed 30 years ago, were not touched by the text-books. The mental instability of the present generation might be due to the mechanised

world, the war, changing views of parental duties, or unhappy homes; but educationists must continue to insist upon the highest principles of truth, honour, and justice, and recognise that there were many elements in the modern child which seemed to call for wise medical and psychological assistance.

Dr. EVA M. CLEMENTS spoke as medical officer of a large girls' school. She said that even for the "difficult" child public school influence was undoubtedly the best hope for development. She described several examples of difficult children of two classes: the sadistic and the uncontrolled. In Wycombe Abbey the problem had to be seen from two sides: was it right that the educational system should require regular mental application during the process of adolescence; or was it right that, as an offset to the emotional disturbance, a suitable routine of mental effort and healthy physical exercises should be provided? For some time it had been approached from the latter standpoint, with satisfactory results. Girls were taught to regard emotional disturbances as natural processes which should not be allowed to divert attention from the daily occupation, and organised games and gymnasium had played a great part in dispelling romanticism. House mistresses were prepared to make up for any deficiencies in the mother's instruction, but the time for regular sex instruction was long overdue, and the medical profession ought to give teachers a lead in this direction. Exhibitions of the "sex complex" were usually found side by side with other defects of character, and were to be remedied by general character training. Careful watch was kept for signs of over-pressure, especially on rapidly growing girls.

Dr. S. BARTON HALL (Liverpool) advocated the "personality" approach to the child. The extraverted child might, he said, find as much difficulty in adaptation as the schizoid, for he might sink into a haphazard existence for want of an integrating purpose.

Dr. MORRIS COHEN said that in South Africa, an examination-ridden country, an apparent seasonal incidence of dementia præcox was to be explained by the demands made on children by parents and teachers before the summer examinations. Many brilliant scholars broke down just before the test. Pointing out that toxæmia was often a mental stimulant, he suggested the novel theory that dementia præcox might be precipitated by exhaustion and the consequent withdrawal of a toxæmia.

Dr. WILLIAM BROWN defended psychology as taught at the universities, and maintained that schoolmasters knew a surprising amount of psychology.

Dr. MARGARET LOWENFELD said that the child felt his maladjustment more keenly than anyone. She deplored the lack of emotional training and outlet in public schools; the child was doing his best to deal with the conflict between the home and the school ideals, and much could be done to help him by masters and mistresses, especially those in charge of games.

Dr. SYBILLE YATES suggested that many children refused to progress because they feared the power for evil which knowledge would give them. The remedy was to teach them how knowledge could be used well both in their after-life and their immediate surroundings.

Dr. EVELYN LUCAS (Bristol) complained of the difficulty of detecting fatigue without a norm. She said that many useful psychiatric clinics were conducted in America by church organisations. The modern child could hardly be blamed, she thought, for trying to adapt himself to a swiftly moving and mechanised world. A great difficulty was the difference between the child's experience and that of his elders.

Dr. L. M. WETHERLY said that the aim of the educationist should be to find out the individual bent of each child, as had been the practice in Germany in the 'sixties.

Dr. CRICHTON-MILLER replied.

REVIEWS AND NOTICES OF BOOKS

Adulteration and Analysis of Foods and Drugs

Birmingham Methods and Analyses of Samples; Review of British Prosecutions during Half a Century. By J. F. LIVERSEEGE, F.I.C., formerly Public Analyst to the City of Birmingham. London: J. and A. Churchill. 1932. Pp. 599. 36*s*.

Mr. Liverseege has produced an original and practical work of great value to those who have to deal with food adulteration and to those engaged in food analysis. Its general character is shown in the title, where adulteration is placed before analysis, and throughout the book the former takes pride of place. Analytical methods are described but often only briefly, and few alternative methods are given, while analyses of many substances in foods are covered by references to the *Analyst* or other journals where they are fully described. Books upon analytical methods are abundant, however, and this arrangement allows Mr. Liverseege space to include much discussion upon adulteration practices, their detection and significance, which are especially useful because they are commonly neglected in text-books. The chapter on milk is a good illustration of the general plan: 13 pages are devoted to its composition and the factors influencing variation, 10 pages to adulteration points, 4 pages to actual analytical methods, and 2 pages to the calculation of adulteration. The remaining 15 pages are utilised for condensed, separated, and dried milk, and such topics as colouring matter and preservatives.

The first five chapters, covering administration, the certificates of public analysts, and evidence in prosecutions, contain much useful advice, the chapter on sampling being particularly helpful, since a good deal of time-consuming analytical work may be wasted in this pursuit. In the chapter on general methods of analysis there are two good tables on the pH range of indicators and on the sensitiveness of indicators. The chapter on methods of calculation is also valuable, since information usually omitted from books is included; but the diagram illustrating alligation is not clearly explained.

The section on metallic impurities is comprehensive, but although Schryver's gravimetric method for determining tin is given, no mention is made of that author's useful colorimetric method. An unusual amount of space is devoted to foods and drinks which are often inadequately treated—such as aerated drinks, cordials, medicated wines, preserved fruits, and various meat products. About 100 pages are given to drugs, and these include remarks on dispensing errors and accuracy.

Special mention may be made of the useful constants and factors for sugar analysis; notes on Macara's important papers on jam analysis and particulars of his method of calculating glucose (hitherto unpublished); some interesting experiments

on the evaporation of alcohol from whisky; and, under vinegar, experiments on the reduction of acetic acid effected by certain micro-organisms. In the chapter on milk the records given of the range of composition of milk at the farm under varied weather conditions is of much practical utility. The author's experience is that alleged natural variations are not nearly so common or so great as is often stated. A noticeable feature of the book is the selected abstracts from prosecutions. There are no illustrations.

A Short Practice of Surgery

By HAMILTON BAILEY, F.R.C.S., Surgeon, Royal Northern Hospital; and R. J. MCNEILL LOVE, M.S., F.R.C.S., Surgeon, Royal Northern and Metropolitan Hospitals. Vol. I. London: H. K. Lewis and Co., Ltd. 1932. Pp. 536. 20s.

THIS is the first volume of the merest outline of surgery. The page is small, the print is large, and there are many illustrations. It is an epitome of surgery, a cram-book in (to students) a very attractive form. The authors certainly have the gift of condensed exposition. If it is read as a revision book only it can be heartily recommended, but its use as the sole text-book is to be discouraged. There is room only for simple facts and but little for explanation of the interesting phenomena of surgery. Artistically, a few of the pictures leave much to be desired, but the printing of both text and illustrations is excellent.

Pulmonary Tuberculosis

Fourth edition. By MAURICE FISHBERG, M.D., Chief of the Tuberculosis Service, Montefiore Hospital. London: Henry Kimpton. 1932. Two volumes. Pp. 1191. 70s.

Dr. Maurice Fishberg's book requires no introduction, for it has long been accepted as the standard work in English on pulmonary tuberculosis. The fourth edition will be studied with interest by those who have profited from Dr. Fishberg's writing in the past, and by a new generation of readers. Many of the old chapters have been rewritten, and new sections have been added dealing with recent research on bacteriological problems, with modern conceptions of the various types of disease as revealed by radiology, and with the recent attempts to establish immunity by the employment of vaccines. Over 100 new illustrations, mainly reproductions from radiograms, have been added, and this expansion has necessitated the division of the work into two volumes, each containing over 500 pages. Some reduction in size might perhaps have been effected by condensing the descriptions of methods of physical examination now obsolete—"the art of hooked finger percussion between the heads of the sterno-cleido-mastoid" is hardly worth acquiring to-day—but there are not many pages in either volume which could be sacrificed without loss.

The chapters on treatment are stimulating. Not every reader will agree with the author's conclusions, but the student will find here a corrective to extravagant hopes and unjustifiable despairs. Dr. Fishberg's views on sanatorium treatment are well known—"that careful home treatment is productive of immediate and ultimate results equal to those of institutional treatment, and is less costly to the patient and the community." This is certainly true for many of the chronic forms of phthisis, especially those of the proliferative type. It is, however, quite impossible to secure careful home treatment for the majority of young consumptives, collapse therapy in its earlier stages cannot be carried out at home, and domiciliary treatment does not offer facilities for serial radiograms without which the patient's progress cannot be determined.

Obviously in a work of this size the individual reader will find statements which he will wish to contravert. Dr. Fishberg at times exults in the rôle of iconoclast, and like the great American poet delights "to sound a barbaric yawp over the roofs" of the medical world. But it is well that the complacency of the enthusiast for collapse therapy and other special forms of treatment should be disturbed, for the danger that interest in treatment may be substituted for interest in the results of treatment is a very real one. The pioneer almost inevitably loses his sense of proportion. To this attitude of mind Dr. Fishberg's writing is a wholesome antidote. His book should be carefully read and re-read by all physicians who are charged with the care of consumptives, whether in general practice, in sanatoriums, or at tuberculosis dispensaries.

A Thousand Marriages

By R. L. DICKINSON, M.D., and L. BEAN. London: Williams and Norgate, Ltd., and Baillière, Tindall and Cox. 1932. Pp. 482. 21s.

THIS book is a study of the married lives of 1098 patients seen by an American gynæcologist of experience and repute during 47 years of practice. The average length of time over which his observations extend is seven years. His average patient was a young wife of the cultured American type, seen from her thirty-first to thirty-fifth year, whose two or three years of experience in a profession had ended at marriage to a professional man. The educational advantages of the couple were above the American average. Of the patients seen, a quarter came first for care in childbirth, another quarter for problems of marital adjustment or sterility, another quarter for the treatment of pelvic disease, and the remainder for miscellaneous reasons. It will thus be seen that the material on which the study is based is in no sense representative of the American population as a whole; far less can it be regarded as typical of this country. This is a point which should be borne in mind, since the material is analysed with thoroughness from its several different standpoints, and will doubtless be much quoted by future writers on marriage.

The danger of generalising from these selected findings makes it difficult to evaluate their importance. The following are among the more noteworthy conclusions of the study: only three in five of the couples investigated have succeeded in adjusting themselves to marriage without complaint; fertility varies as sexual harmony varies, and is notably low in women who suffer from dyspareunia, among whom treatment usually results in the cessation of pain, but not in a return of sexual desire; of the contraceptive measures taken, those employed by women are less reliable than those utilised by men; coitus takes place on an average daily or oftener in no less than 16 per cent. of the reported cases; 40 per cent. of the husbands are incapable of prolonging coitus for longer than three minutes; two out of five women have rarely or never experienced orgasm; adjustment in marriage is favoured by pre-marital instruction in biology and sexual physiology; there is no more

evidence of masturbation before marriage among mal-adjusted than among well-adjusted wives.

The book abounds in case-histories whose most instructive feature is that they record several observations of the patient at different intervals of her life. An interesting feature of some of these is the way that the subjects, when seen in later years, had completely forgotten sexual experiences which, in preceding interviews, had been recorded as playing an important part in their lives. Dr. Dickinson's observations are detailed and painstaking, and his analyses conform in thoroughness to those of other American medico-sociological writers. Unfortunately, however, the style in which the book is written is not as concise and clear as the author intends.

An Introduction to Dermatology

By R. L. SUTTON, Sc.D., LL.D., F.R.S. Edin., Professor of Dermatology in the University of Kansas; and R. L. SUTTON, Junr., A.M., M.D., Dermatologist to Kansas City General Hospital. London: Henry Kimpton. 1932. With 183 illustrations. Pp. 565. 25*s*.

Sutton's well-known text-book, which reached its eighth edition in 1931, is here reproduced in a much condensed form. The preface is addressed to the student whose difficulties, it is asserted, can be more readily comprehended by a man nearer to him in years and academic standing than by one who has devoted a lifetime to one subject and is therefore apt to take too much for granted. Father and son have collaborated to overcome both the disabilities of age and experience, and those of youth and immaturity, and the result justifies their undertaking. Though it lacks the liveliness and individuality of the original, this book is well organised and thoroughly up to date. Descriptions of the various dermatoses are brief, and the space given to treatment is even briefer, while dissertations on pathology are almost non-existent. The illustrations are excellent, being replicas of some of the more typical in the original work. Binding and printing are the same. There is an efficient index, but the bibliography—a striking and valuable feature of the older work—is missing.

Die Quarzlampe und ihre medizinische Anwendung

By Dr. ERICH WILLISCH, Assistant in the Institute of Physical Medicine, Vienna Hospital. With an introduction by Dr. JOSEF KOWARSCHIK. Vienna: Julius Springer. 1932. Pp. 168. R.M. 8.60.

Dr. Willisch wrote this manual at the request of Dr. Kowarschik, director of the Institute of Physical Medicine, Vienna. It represents the views of the Vienna school, and gives a readable account of apparatus and technique. Besides the lamps in general use, both in Vienna and in this country, Dr. Willisch employs the Sollarcalamp which combines the features of a tungsten arc and mercury-vapour lamp, and is said to be particularly rich in the longer wave ultra-violet rays and in infra-red rays. In the description of clinical cases the unusually good results obtained in asthma both in adults and in children deserve study. The author does not express views which are very new or revolutionary, but he gives a balanced and clear account of experience based on many years' work. Apart from its interest for the specialist it forms a good introduction to this branch of actinotherapy.

Cancer: Civilisation: Degeneration

By JOHN COPE. London: H. K. Lewis and Co., Ltd. 1932. Pp. 293. 15*s*.

THIS does not pretend to be a scientific work. "Mr. Cope" says he is tired of the laboratory workers on the cancer problem and of their cautious demand for absolute proof, and accuses them of insisting that nothing be applied to man that has not been found in the laboratory animal. He expresses respect for them, but he does not think their vision is sufficiently wide. "Although it may be true that from this mountain in labour," he says, "nothing has so far emerged but a cancer-bearing mouse, those who have been engaged in throwing up this mountain are able men." Their methods are applicable, he thinks, to the study of microbes, but unsuitable for the study of a derangement in the function or structure of the human body. He appeals, therefore, to the lay public with his theory that cancer is a disease of civilisation, to be cured by a return to simpler modes of life. In support of his thesis he is satisfied with many unproven statements—for instance, that the man who walks and pushes a crowded perambulator is healthier than the man who drives in a car, and that both he and his wife are less liable to become cancerous. He declares that cancer is the result of insufficient use and consequent degeneration of certain organs, causing increase of local bacterial disease and the production of cancer-causing toxins. Its cure, therefore, is in the greater use of these organs; in other words, a return to hard and raw foods to stimulate the digestive system, and full use of the reproductive system to save the female generative organs.

REPORTS AND ANALYSES

STRAWBERRY JAM

(ENERGEN FOODS CO., LTD., WILLESDEN, LONDON)

IN this preparation of strawberry jam the whole fruit is easily discernible. The flavour is characteristic of cooked strawberry, but is not so sweet as ordinary jam.

When analysed the following results were obtained:—

Soluble solids	40·3 per cent.
Insoluble solids	4·1 " "
Water	55·6 " "

Included in the soluble solids are:—

Cane sugar	2·5 per cent.
Invert "	3·8 " "
Acid (as malic acid)	0·65 " "
Ash	0·44 " "

When tested for the presence of sulphites, borates, benzoates, and salicylates, and also for colouring matter, negative results were obtained. The claim of the makers that the jam is free from preservatives and added colouring matters is justified.

The jam is a genuine product and the fact that its sugar content is no more than is natural to the cooked strawberry should be of interest to those whose sugar tolerance is low. Strawberry jam usually contains about 66–68 per cent. of sugar.

HOLME VALLEY HOSPITAL MATERNITY WARD.—Mrs. Williams, widow of Dr. H. W. Williams, medical officer of health for the Holme Valley, recently opened a new maternity ward at the Holme Valley Memorial Hospital, Huddersfield. It contains four beds, a private ward, and a theatre.

Trophic Vulvo-Vaginitis of the Menopause

TROPHIC vulvo-vaginitis of the menopause, a frequent affection, making its appearance after the natural menopause, or surgical castration, is favourably influenced by applications of Antiphlogistine Dressing.

Through its high glycerine content and the synergistic ingredients entering into its composition, Antiphlogistine Dressing acts as an analgesic, osmotic, hyperæmic and decongestive agent, relaxing the inflamed tissues and relieving pain. Antiphlogistine Dressings are usually sufficient to relieve the pruritus and burning sensations, characteristic of this condition.

Sample and literature will be sent upon request

ANTIPHLOGISTINE

BRAND

DRESSING

The Denver Chemical Manufacturing Co.

LONDON, E. 3.

The Product of Unique Experience

PARKE, DAVIS & Co. introduced Adrenalin to the medical profession in 1901. During the thirty years that have elapsed, they have manufactured it continuously, and their long experience has convinced them that natural Adrenalin possesses many advantages over the synthetic product.

Adrenalin (P., D. & Co.)—the original and well-tried preparation—is extracted from the medullary portion of selected adrenal glands. The isolated substance is then standardised by both physiological and chemical methods to secure full activity of the finished preparations.

Medical men can make sure of obtaining an Adrenalin that is potent, uniform in action, and reliable by specifying "P., D. & Co.".

Full particulars of Adrenalin (P., D. & Co.) and its uses in medicine will be supplied on request. Adrenalin Chloride Solution, P., D. & Co., is supplied in bottles and ampoules. Hypodermic Tablets, Inhalant, Lozenges, Suppositories, Ointments, etc., and Adrephine (Adrenalin-Ephedrine Compound) are also available.

ADRENALIN ORIGINAL P.D.&CO.

In

Shock and Collapse
Anaphylactic Reactions
Febrile Conditions
Cardiovascular Disorders
Asthma
Hay Fever
Respiratory Disorders
Gastro-intestinal Disorders

In

Ocular Inflammations
Rectal Disorders
Cutaneous Disorders
Neuralgic Pain
Hæmorrhage
Surgery
Local Anæsthesia
Dentistry
Organo therapy

PARKE, DAVIS & CO., 50 BEAK STREET, LONDON, W.1.
Laboratories: Hounslow, Middlesex : : Inc. U.S.A., Liability Ltd.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 3, 1932

SEX HORMONE THERAPY

A PAPER from Edinburgh in our present issue raises points of considerable importance in connexion with the possible use of sex hormones in cases of derangement of the menstrual cycle and pregnancy. In the first place, it illustrates once again the extraordinary difficulties standing in the way of clinical research on this particular subject. Even by stretching to breaking-point the principles usually accepted in planning and interpreting a laboratory experiment, it is still hard to obtain clinical results sufficiently clear-cut and unequivocal to pass critical examination. The scarcity of proper "control" material, for instance, almost precludes the performance of a clinical experiment in the sense that the word is understood in the laboratory. The difficulty can only be dealt with satisfactorily by application of the laws of probability to the results (real or apparent) obtained in a large series of cases. Such results cannot of course be provided in a brief preliminary note designed merely to indicate the scope of what is being attempted.

In the absence of clinical proof Prof. JOHNSTONE and his colleagues must expect criticism of their theoretical premises. The question arises how far their use of gonadotropic hormones (ρ-factors, prolans) rests on a sound biological foundation. If we accept the view that normal menstruation is the end of the pseudopregnant phase (not a new idea, but one which has been part of orthodox gynæcological opinion for half a century, and which gave rise to the axiom that "women menstruate because they do not conceive"), it is necessary to remember that menstruation of a kind may take place without a preceding ovulation, and therefore from a uterus not showing the usual premenstrual development controlled by the corpus luteum. Work on monkeys has made it clear that menstruation induced by injection of œstrin is of this latter type, and is merely hæmorrhage from an "interval" type of endometrium. What good, if any, can result from inducing this phenomenon in cases of amenorrhœa is not apparent. What seems to be needed is rather the administration of progestin superimposed on sensitisation of the uterus with œstrin. Whether this can be simulated by injection of ρ-factors is open to doubt; moreover, the Edinburgh workers say definitely that the luteinising and follicle-maturing principles have not been separated and are therefore administered simultaneously. The same remedy has been used for the four diverse conditions, amenorrhœa, menorrhagia, dysmenorrhœa, and habitual abortion. In treating dysmenorrhœa the object is to decrease the contractility of the uterus just before and at the time of menstruation by increasing luteal activity. But even if the uterus-desensitising principle of the corpus luteum can be separated from that responsible for endometrical development, there is no evidence that luteal tissue stimulated by ρ-factors produces the former to the exclusion of the other. In other words, the treatment of dysmenorrhœa by this means would theoretically involve the prolongation of the luteal phase, and presumably, therefore, the suppression of menstruation of any kind. The basis of the treatment of the final type of derangement dealt with—habitual abortion—is in fact the assumption that the ρ-factors stave off a premature end to the luteal phase.

Prof. JOHNSTONE and his colleagues in recording their encouraging experiences refer to the spacing of dosage so as to avoid dangerous reactions in the ovary. But is this precaution sufficient? We are dealing here with substances whose potency is astonishing and whose biological action is imperfectly understood. We know to what chaos the ovaries of the lower animals are reduced by their administration even for a brief period: maturing follicles, blood follicles, atretic follicles, luteinising follicles, atretic corpora lutea and normal corpora lutea are produced in magnificent profusion with a corresponding reduction in the number of primary follicles available for subsequent normal maturation. How long it takes the ovary to recover from such a condition is uncertain. Until the action of the ovary-stimulating hormones is better understood and can be accurately controlled would it not be wiser to limit ovarian therapy to the use of the less volcanic ovarian hormones, alone or in combination? If, for instance, the authors of the paper are right in ascribing dysmenorrhœa and habitual abortion to corpus luteum deficiency, the reasonable treatment of these two disorders would surely be the administration of the two corpus luteum hormones—the uterus-desensitising hormone and progestin respectively. In the present state of our knowledge the clinical use of ρ-factors should certainly not be attempted in ordinary practice.

THE POLICY OF NATIONAL INSURANCE

THE panel conference will as usual meet in the early autumn to consider the report of its executive body, the Insurance Acts Committee, a report which contains an unusual amount of material for discussion. Medicine is only one of three partners in health insurance practice and the summer has given time and opportunity to the others for a review of the national scheme and for the expression of their troubles and anxieties. During the last month or two there have been a number of frank utterances at the failure to reach an ideal position, and many hard criticisms of politicians who have to be realists in a workaday world. At one of the more important of these conferences the president of the trade-union section lamented

that the much desired extension of benefits had not become an accomplished fact during his year of office. Unless the present range of service were extended to include a specialist and consultant service he feared that the cost of medical benefit was in danger of being wasted. At the moment, he said, the service stops short just where expert medical advice is needed; the insured person is allowed to go on suffering, with the result of an excessive drain on sickness benefit funds. We know, however, from the report of the Government Actuary that as a matter of fact the trade-union group produces a gross surplus per member more than double that of the industrial group; and although this advantage may be partly due to more careful administration it can hardly be altogether independent of the good physique of this group of insured persons. That is the more probable since the five-yearly valuation showed that societies which were rich in 1923 were richer in 1928, and societies which were poor then are poorer still now. Certain societies have money to give away to members who do not require additional benefits, while other societies are unable to provide even the statutory cash benefits of the Act. It is this position that turns the mind to insurance principles. The spirit of the old friendly society was for persons placed in favourable positions to help those who are not so favourably placed, and the intention of the Act of 1911 was to guarantee a contribution from the healthy towards the cost of restoring the sick to health. The policy of the trade-union group is to value assets and liabilities as a whole, every insured person receiving equal benefit; and this received some support from the Royal Commission of 1925 which agreed to the pooling of 50 per cent. of surpluses, redistributing them for the benefit of the whole insured population. The trade-union group would go further and abolish the approved societies and with them the present panel system.

An interesting corrective to this view appeared in a recent number of the *Insurance Gazette*, where the opinion is expressed that national health should be run on sound business lines independent of political views, drawing a lesson from the unemployment scheme which became insolvent owing to politicians of all parties ignoring insurance principles. According to the *Gazette* it would be a happy day for national health insurance were it put under the control of an organisation like the British Broadcasting Corporation, or something even more independent of political control, to be called the "self-help insurance fund." The medical man may well ask under these circumstances—What is insurance? It may be recalled that, at the initiation of the scheme, a prominent actuary declared that the Act of 1911 was not insurance at all; insurance, he said, was a misnomer for an Act providing for all and sundry without inspection or selection, and for a scheme which included a contribution from State funds. We have no need to remind readers that national health insurance is only part of a larger scheme of social service, devised for the prevention and treatment of national sickness and ill-health. While the scheme should be administered on business lines, we dare not overlook the ideals on which it was based.

THE DIETETIC TREATMENT OF URINARY INFECTIONS

WHEN chronic pyuria fails to respond to the ordinary medical treatment the next step as a rule is urography, with operative intervention if need be. But unfortunately the results of surgery are often no better than those of medicine. In children congenital anomalies of the genito-urinary tract account for a considerable proportion of the cases of pyuria of long standing, but even where the primary cause is removable the presence of infected urine adds greatly to the surgeon's difficulties. It is clear that any method of rendering the urine sterile, even as a preliminary to cystoscopy or operation, will be of value, and attention has already been called in our columns by Prof. H. CABOT to the independent observations of A. L. CLARK and H. F. HELMHOLTZ, of the Mayo Clinic, on the use of a ketogenic diet for this purpose.

Since their preliminary reports, both these workers have gone a good deal further. HELMHOLTZ [1] originally noticed that the urine of a child with epilepsy, who was in a condition of ketosis, remained free from bacterial cloudiness after standing at room temperature for a week. This led him to investigate the urinary bactericidal power of patients on a ketogenic diet after seeding the urine with various organisms. He found that the bactericidal effect is to some extent related to the hydrogen-ion concentration, the effect being evident in those urines having a pH below 5·6, whereas even in the presence of marked ketosis urine having a pH of over 5·6 is unlikely to prove bactericidal. Control experiments in the absence of ketosis showed that a pH below 4·8 is necessary to produce bacteriostasis—a closely similar finding to the earlier observation of A. T. SHOHL and J. H. JANNEY [3] in relation to *B. coli* infections. HELMHOLTZ gives clinical notes of four cases of chronic pyuria in children (three of them with major anomalies of the urinary tract) whose urine was rendered sterile on a ketogenic diet. CLARK [2] has reported in detail the results of this method of treatment in 15 adults. In all but one of them—in whom acetone bodies and reduction of pH of the urine failed to appear—ketosis was followed by a striking improvement in the condition of the urine. He concludes that *B. coli* infection responds to this treatment more readily than pseudomonas or *Bacillus aerogenes*, although in cases due to the two last the urine lost its haziness and the organisms were only recoverable on culture. In our present issue Dr. CLARK considers some of the requirements and limitations of the method of treatment on the basis of 50 cases of bacilluria to which it has been applied, and gives some account of the diet employed. His results and those of HELMHOLTZ

[1] Proc. staff meetings Mayo Clinic, 1931, vi., 609; Acta Pædiat., 1932, xiii., 195.
[2] Proc. staff meetings Mayo Clinic, 1931, vi., 605; Jour. Amer. Med. Assoc., 1932, xcviii., 1710. [3] Jour. of Urol., 1917, i., 211.

point to the presence of a bactericidal substance in the urine of patients on a ketogenic diet which is not accounted for solely on the basis of a change of pH. While the prescription of a ketogenic diet has certain obvious disadvantages and requires coöperation and much fortitude from the patient, its use in epilepsy has now been wide enough to show that in the great majority of cases (both in children and adults) it can be tolerated for a long time. Personal testimony, such as that given by Dr. C. M. WILSON [4] concerning the efficacy of the dietetic treatment in bacilluria, should do much to reassure those who hesitate to embark on it.

The method of prescription recommended by HELMHOLTZ for children is as follows: the patient is given about 50 calories per kg. of body-weight and including 1 g. protein per kg. of body-weight. Thus for a child of 30 kg. the initial diet is 30 g. (120 calories) of protein, 70 g. (280 calories) of carbohydrate, and the balance up to 1500 calories in fat (120 g.). On the second day the carbohydrate is reduced to 50 g., on the third day to 30 g., on the fourth to 20 g., on the fifth to 15 g., and on the sixth to 10 g. The fat is correspondingly increased on each day to keep the total number of calories constant. Usually this will produce strong ketosis with a pH below 5·5, but if it does not, 1 to 3 g. of ammonium chloride daily will bring the pH within the required range. In spite of the unpalatability of such a diet, many patients will take it surprisingly well, and the method of treatment seems promising.

[4] St. Mary's Hosp. Gaz., June, 1932, p. 85.

ANNOTATIONS

AN ASSOCIATION OF ANÆSTHETISTS

Prof. A. H. Burgess recently remarked that the development of any specialty will generally be found to have followed certain lines—namely, the establishment of a diploma or degree, the setting up of a special society, or a hospital devoted to the particular branch of practice concerned. None of these developments has hitherto been reached by anæsthetics, but the omission is now partly made good by the formation of an independent society of anæsthetists announced in our correspondence columns. One of the objects of this Association of Anæsthetists of Great Britain and Ireland will, we understand, be the institution of a diploma, in order to enable the public to distinguish between those who are experts from those who have made no special study of anæsthetics. The council elected at the inaugural meeting is fairly representative of the whole country, although important centres like Leeds, Newcastle, and Liverpool at present have no councillors. Complete representation would have entailed a council of unwieldly size, and other centres will be invited to nominate representatives who may be summoned to the council when they wish to bring forward local questions. As to the foundation of such a society, we are satisfied that it is to be welcomed as likely to lead to improvement in the teaching of anæsthetics, with its natural consequences of improved practice and status. Anæsthetists themselves are aware of the need for progress. They are painfully conscious of the limitations imposed upon them, which may lead to a choice between not teaching at all or displeasing the surgeon for whom they are working. If they consider the interests of the student they are apt seriously to damage their own interests. Not many surgeons enjoy that breadth of vision which enables them to comprehend at all times the difficulties with which their anæsthetists are contending when they are expected to satisfy at the same time both the operator and the pupil. The surgeon naturally dislikes it if the anæsthetist talks; the student complains if he does not. Facilities should be provided by such arrangements for anæsthetists' attendances as would give them opportunities for practical teaching during some of the less important operations, those for example carried out by resident medical officers. For the most valuable teaching which they can give is only to be had at the operating table; and it is carried out with difficulty if speech is barred. Recent advances make it imperative that there should be expert anæsthetists in every part of the country if surgery is to reap its fullest possible success. Considering how great a part the correct selection and administration of the anæsthetic plays in the patient's welfare and in the completely successful outcome of the operation, it is matter for surprise that surgeons themselves have not played a more active part in promoting the interests of specialist anæsthetists. They could do much to ensure that hospitals have an adequate anæsthetic service, and that those who conduct it are given due reward for their labours, either in the form of prestige and position or in substantial remuneration. There is still at least one important hospital in London where no acting anæsthetist is on the staff, or even on the staff of the medical school; nor do anæsthetists receive in compensation a substantial honorarium. That is an anachronism which is thoroughly detrimental to the progress of anæsthesia. The student is not attracted to a branch of work thus obviously depreciated. By the kind of steps which we have suggested, and by others doubtless to be encouraged by the new Association, the best type of student could be encouraged to take up anæsthetics as his life work. The surgeons as well as the public at large would benefit.

UNEXPLAINED GASTRIC HÆMORRHAGE

EVEN weeks or months later it is often difficult to say what precisely was the cause of a hæmatemesis. A French journal [1] has lately written to a number of eminent physicians and surgeons and asked them the question: "Apart from cancer, gastric ulcer, and cirrhosis of the liver, what, in your opinion, are the most frequent causes of gastric hæmorrhage?" Perhaps the most interesting aspect of the replies is their diversity. Thus Prof. Demade (Bordeaux) cites arterial hypertension as one of the most important causes, putting forward perigastritis and acute dilatation of the stomach as others. Dr. G. Parturier and Dr. Roger Feldstein speak of abdominal ptosis, Dr. Victor Pauchet gives cholecystitis, appendicitis, and obscure splenic diseases, whilst Dr. Ciminata (Monza) and Dr. A. F. Hurst (London) consider that

[1] Vie Méd., 1932, xiv., 662.

gastritis is not uncommonly a cause. Hurst goes on to point out the importance of splenic anæmia and the hæmorrhagic diathesis.

It is obvious, when reading this strangely varying list, emanating from observers of great experience, that, although every one of them has seen hæmorrhage from causes other than those excluded by the editorial premises, none of them has been able to make an exact diagnosis in any large proportion of the obscure cases. Perhaps the most philosophic contribution to the inquiry is that of Dr. P. A. Carrié (Paris) who points out that the mere failure to make a diagnosis either of cirrhosis or of cancer or of gastric ulcer by no means excludes the possibility that one of these common diseases is present. He recalls a series of autopsies on fatal cases where cirrhosis, unsuspected during life, was demonstrated; he emphasises the not infrequent occurrence of hæmorrhage as the first sign of cancer in cases where even expert radiography could not reveal the lesion for several months, and further he dwells upon acute ulceration of the stomach in which hæmorrhage may be the sole manifestation. It is perhaps by an oversight that in asking their question the editors of the journal did not exclude hæmatemesis associated with splenomegaly; undoubtedly this association is not unusual. But when these cases are excluded it certainly remains highly probable that gastric ulcer or cirrhosis of the liver is the cause.

There seems to be controversy as to whether arterial hypertension is of importance. One writer says that all authorities agree that it is not a cause, whilst another, as above noted, gives it first place on his list. Considering how common hypertension is, this is perhaps remarkable; it is certainly an occasional cause of hæmorrhage, but it is met with in only a small proportion of people with high blood pressure.

The problem of diffuse hæmorrhage from the stomach is also considered in a paper by E. L. Bortz,[1] who reviews the literature of the subject, including the classical work of Dieulafoy on acute ulceration and the observations of Hale-White on gastrostaxis. He offers a valuable word of warning to surgeons, pointing out the danger of laparotomy unless the exact site of bleeding is known, and the impossibility of determining such a site in a considerable number of cases.

[1] Arch. Int. Med., July, 1932, p. 1.

GEORG SCHMORL

THE sudden death at Dresden of Prof. Christian Georg Schmorl in his 71st year will be deeply felt in this country where he had many ex-pupils. One who studied with him in 1905–06 at the Stadtkrankenhaus, where he was Prosektor, writes: "To those who had been taught in England that morbid anatomy was a dead subject the first few days with Schmorl came as an unforgettable revelation. Early every morning he came briskly into the assistant's room with his microscope, and carefully demonstrated to each of us any sections that we had prepared. Every change was first carefully noted and then by a reasoned analysis of these observations a picture was constructed of the processes that had taken place. His criticisms were ever kindly; if he found it necessary to say that a section was unpleasantly thick, he would add that after all the thicker a section the more there was to be seen in it! Later, when we had performed the necropsies, he came into the post-mortem room, went over every case and dictated a summary. All the time he worked he taught, drawing freely from his vast store of previous experience and from his wide knowledge of the literature. His predictions of what would be found appeared to be uncanny. With a single sweep of the knife he would show us some important clue that had been missed. The most important organs from interesting cases were reserved for a weekly demonstration in the lecture theatre which was attended by the clinical staff of the hospital and, before the war at any rate, by all the practitioners in the town. At these demonstrations his powers were perhaps exhibited most dramatically. After the doctor who had had charge of the patient had given his opinion of the illness, Schmorl speaking at a great pace without a pause demonstrated the findings at the necropsy and from these constructed a reasoned account of every step in the various processes that had led to death: a vivid picture was thus given of the life of the patient, often extending back for years."

Prof. Schmorl was for nearly thirty years secretary to the German Pathological Society. His book on histo-pathological methods, originally an appendix to the large work of Birch-Hirschfeld, came to be known as "der kleine Schmorl" and ran through 15 editions.

THE BLOOD GROUPS IN LAW

THE German law courts have for some years accepted evidence founded on blood grouping as absolute proof of non-paternity, and orders are frequently made, as a matter of course, in suits for affiliation. The reason for their quick and whole-hearted acceptance of the blood groups lies partly in the high incidence of paternity suits in Teutonic countries, and partly in certain peculiarities of the German code. German law is not restricted by the old civil law maxim *pater semper incertus*; and the question for the court's decision is stated in a negative form peculiarly well adapted to an answer on the basis of blood-group evidence: "Is it, in the circumstances, obviously impossible (den Umständen nach offenbar unmöglich) for the defendant to be the father of this child?" Moreover, as Prof. Leone Lattes points out in his "Individuality of the Blood," an English edition of which was reviewed in our issue of August 6th (p. 353), group tests possess a unique importance in rebutting the plea of *exceptio plurium concumbentium*, for if it is proved that the father might equally well have been one of several men, only a biological test can narrow the field. Moreover, in Germany a successful plea of *exceptio plurium* deprives an illegitimate child of all rights, unless it can be conclusively proved that the man in question could not possibly have been the father.

In Czechoslovakia blood-group evidence was set firmly on its feet by a decision of the Supreme Court of March 2nd, 1927, reversing the judgment of the courts of first and second instance against a defendant who proved by his blood group that he could not have been the father of a child whose paternity was in question.[1] In this country blood-group evidence has not yet been much used, but its admissibility has not been contested. In America, where innovations are usually well received, it has met with surprisingly little recognition. Its value was exhaustively discussed this year, however, by the Society of Medical Jurisprudence in New York,[2] and the speakers, with one exception, were strongly in its favour. Dr. G. I. Swetlow said that its admissibility has not yet been

[1] Marx, A. M.: Med. Klinik, June 3rd, p. 787.
[2] Med. Times, 1932, lx., 203.

decided. It is easy to see one possible reason why advocates here and in America hesitate to call blood-group evidence in defending affiliation suits. The legal profession have not yet realised that the tests are limited to proving non-paternity only, and are never positive. It is probable that many solicitors, when the question of calling in a pathologist arises, feel that if the evidence does not go in their favour it will go against them. It is unnecessary to point out the fallacy of this reasoning, but until lawyers are thoroughly reassured by a few practical demonstrations they will probably continue to play, as they think, for safety. Another possible obstacle is the question of whether a court can order a sample of blood to be taken from a defendant. A New York judgment, quoted by Dr. Swetlow, says quite definitely that it can, in civil and criminal proceedings alike, but in this country such an order is out of the question; a test can only be made with the consent of the defendant, which is probably often withheld from a mistaken fear that the test may cut both ways. A barrister has suggested [3] that in time some form of "discovery" of blood groups may be introduced. A court may order either side to "discover" such documents as it considers are necessary for establishing the truth; it is not unreasonable that blood groups should be placed on the same footing.

SKY-SHOUTING

THE report of the Select Committee on Sky-writing [4] deals not only with smoke-writing by day and the projection of words or patterns upon the clouds by night, but also with "sky-shouting"—i.e., the broadcasting of sound from aircraft either by direct transmission or by relaying. Sky-shouting has been used for advertising purposes in America, Italy, and Sweden, but is not at present regarded as a commercial success. The Committee regard it as objectionable that a raucous noise should be forced upon the hearing of men and women, whether they wish it or no. Whether added to the existing volume of noise in urban areas or obtruded upon the quiet of the countryside, this novel form of noise nuisance seems to the Committee an unnecessary and intolerable imposition; they therefore recommend that, if it shows signs of being developed in this country, it should be prohibited by law for all private purposes. A brief Home Office memorandum, appended to the Committee's report, discusses the legal position. Noise which is a nuisance may be restrained by an action in the High Court, but an application for an injunction must be supported by evidence that the noise causes a substantial interference with the ordinary comforts and pursuits of life in the conditions locally existing. Noises of a brief and transitory character would not easily be checked by this method; such litigation is apt to be difficult and expensive; moreover an action against a particular transmitter would be no shield against nuisance from other persons making similar noises. Statute law has enabled local authorities to make by-laws restricting noise from the operation of wireless loud-speakers or gramophones. Such by-laws, which require confirmation by the Secretary of State, are in practice limited to streets and public places, and proof of annoyance is required. The Home Office observes that by-laws might perhaps cover noise from overhead but they could hardly go so far as to prohibit sky-shouting altogether, without proof of annoyance. The maximum penalty for breach of such by-laws is £5. Certain progressive local authorities, such as the corporation of Edinburgh, have led the way in obtaining powers by private Act for dealing with the nuisance of noise. Precedents of this kind have been noted in our columns during the last few years in our annual summary of public health provisions in local legislation. But it is one thing to pass an enactment and another to enforce it.

To turn from sky-shouting to sky-writing (which was the main concern of the Select Committee), the report advocates control rather than prohibition. The inventors of new methods of projection were modest in stating the limits of their apparatus. The illuminated words or pictures, it appears, cannot be clearly seen from an area larger than one square mile; no projection is possible unless the sky is clouded; summer-time restricts the duration of the requisite darkness, and as the method makes no appeal to a sleeping or deserted world, it was suggested that the average suitable period for sky projection in England is not longer than one hour per night. Conditions of public safety, especially in air defence, air traffic, and coastal navigation, required consideration, as well as the protection of natural amenities. Questions of health or medical treatment are somewhat remote. It may be noted, however, that the Committee point out the undesirability of a sky projector being operated near a hospital in such a way that the glare of the beam enters the windows of the building. The only other point of possible interest to the medical profession is the evidence (apparent in the questioning of witnesses by members of the Committee) that the ubiquitous advertisements of pills and of promises to cure constipation by various patent medicines has exhausted the patience of the public.

PHRENICECTOMY IN BRONCHIECTASIS

THOSE who have charge of patients suffering from one of the most distressing and fatal of pulmonary diseases will read with sympathetic interest any contributions of continental colleagues on the subject of bronchiectasis, the cure of which continues to baffle clinicians at home and abroad. A. Courcoux, A. Bidermann, and A. Alibert [1] have lately recorded three cases of this disease in which a measure of success followed paresis of the diaphragm on the affected side. In each instance the bronchial dilatations were limited to the lung base. In one instance clinical relief was associated with a satisfactory collapse of the dilated bronchi, in two others, though symptoms were ameliorated, radiographic examination after the injection of lipiodol showed little change in the bronchial dilatations. A possible explanation of the relief obtained in the latter might be found in a temporary remission of symptoms due to rest and special care during a period of hospital treatment. Anatomical displacement following the rise in the diaphragm may however have facilitated bronchial drainage in the affected area. E. Rist, who is an ardent advocate of collapse therapy in the treatment of bronchiectasis, has noted similar improvement after phrenic avulsion. Another recent success in the treatment of basal bronchiectasis in a child is reported by M. Lereboullet.[2] The experience of English physicians has been less fortunate. In those cases in which an adherent pleura does not

[3] Trans. Med.-Leg. Soc., 1930–31, xxv., 35.
[4] House of Commons paper 85. 7s.

[1] Rev. de la Tuberc., 1932, xiii., 401.
[2] See report of discussion, ibid., p. 55.

prevent an artificial pneumothorax it is as a rule impossible to collapse the dilated and rigid bronchi and the danger of empyema cannot be ignored if an effusion is provoked by pleural puncture. The risk of the latter complication is avoided when phrenic avulsion takes the place of pneumothorax, but at best it can only be expected to produce a partial collapse of a bronchiectatic lower lobe. It is seldom followed by apposition of the walls of the diseased tubes without which permanent healing cannot be obtained. The pain attending this little operation is however negligible and its risks are slight. For cases of basal bronchiectasis which are not relieved by such means as posture, the creosote chamber, and medicinal treatment this method is worth a trial.

RADIOGRAPHY OF LIVER AND SPLEEN

EARLY last year we referred to a method of rendering the liver and spleen opaque to X rays [1]; it is based on the fact that the reticulo-endothelial system has the property of taking up certain foreign colloids in a selective manner. The various thorium preparations used for the purpose are given intravenously, and the dose is spread over several days, during which the drug accumulates in the spleen and liver,[2] so that the outlines of these organs become visible on radiography. The question arises at once, of course, whether there is any danger of toxic effects, but work carried out at Toronto University on behalf of the manufacturers of Thorotrast is encouraging in this respect. D. A. Irwin [3] states that large quantities injected into rabbits were quite innocuous and caused no reactions. While these experiments were proceeding, the drug was only given to patients past medical or surgical aid, but as it appeared to be harmless its use has been extended. Even in a few patients with advanced cirrhosis it is said to have caused no damage of any kind. The Canadian workers give no contra-indications, but others may prefer to wait for more clinical reports before relaxing their discrimination. Incidentally, W. H. Dickson [4] quotes authority for saying that thorotrast is effective in the arteriography of the limbs and brain, and he considers it superior to the iodine solutions for retrograde pyelography, since it is more opaque and produces no cramps.

HEALTH ORGANISATION AT GENEVA

IN issuing the first annual number of the League Year Book [5] its joint editors, Miss Judith Jackson and Commander Stephen King-Hall, profess only to have made a first experiment on which, in later issues, they hope to improve. A year book of this sort must be a medley of basic information, for reference, and of chronicle of a more transient type. The reader wants to know what the organs of the League of Nations are, and also what they have been doing in the period specially covered. Perhaps in the first number proportionally more basic information has been given than will be justified in the later editions. The constitution of the League health organisation is rather elaborately set forth, with references to the resolutions of the Council and Assembly of the League by which the various organs were set up; and this letterpress is supplemented with a table showing the ramification of committees and subcommittees. The three main organs are the General Advisory Health Council, the Standing Health Committee, and the Epidemiological Intelligence Service. The second of these is a purely League organ, the first being identical with the pre-existing Office international d'hygiène publique, and the third a joint emanation of the League and the Rockefeller Foundation. Twenty-six subcommittees work for the Standing Health Committee, with such various spheres of activity as physical education, penal administration, malaria, sleeping sickness, and price of radium. The personnel of these organs is given in full.

In the topical section of the year book medical and hygienic subjects are but briefly referred to. The recognition given by the Eighteenth Assembly (1931) to the current work of the Health Organisation in general is reported, but from this the reader can only gather that rural hygiene is the zone of the Organisation's most successful labours. Similarly the work of the League Medical Inquiry in China is only touched upon. Against this, three full pages are devoted to the constitution of the new International Leprosy Centre at Rio de Janeiro, of which the League is a sort of honorary patron. Perhaps in the year book for 1933 the current work of the Health Organisation may be more fully discussed. In the first year the bulk of the narrative is devoted to the work of the International Labour Office, the Disarmament Conference, and The Hague Court. Evidently the greatest care has been taken to render it accurate and authoritative.

NERVOUS DISEASE FOLLOWING SMALL-POX AND VACCINATION

THE observation of cases of post-vaccinal encephalitis during the last decade has drawn attention to the occasionally recorded cases of nervous disease associated with small-pox. The whole subject has lately been reviewed by Dr. J. P. Marsden and Dr. E. Weston Hurst [1] who have also described cases in detail. They point out the want of uniformity in the symptoms and pathology of the older records, but they themselves have collected a group of 11 recent cases, of which at least seven resemble the typical syndrome and pathology of post-vaccinal encephalitis. In the present state of uncertainty regarding the immediate cause and pathogenesis of this group of diseases, they have decided to classify by their pathological anatomy and histology those cases which have been examined carefully post mortem. On these grounds they prefer the name "acute perivascular myelinoclasis" for the typical so-called post-vaccinal encephalitis, with its characteristic demyelination in the affected areas of the central nervous system. This pathological condition undoubtedly follows other diseases besides vaccinia and small-pox—especially measles—and may also be a sequela of anti-rabies inoculation. In the seven definite cases reported, associated with variola minor, the onset was 5–13 days after the outcrop of the rash, a period almost the same as in the post-vaccinal cases, and the age of the patients—i.e., 7 to 21 years, in the post-variola cases, was also very similar in the two groups. The recent cases following variola have had a remarkable distribution in time. Six out of the seven occurred between September, 1929, and April, 1930, inclusive, and it is not apparent that this incidence was closely related to the prevalence of small-pox. The post-vaccinal cases also have not been clearly related to the maximal number of vaccinations performed at a susceptible age; moreover, they are now very much rarer than a few years ago. A curiously local distribution is also to be

[1] THE LANCET, 1931, i., 144. [2] Ibid., 1932, i., 1256.
[3] Canad. Med. Assoc. Jour., August, 1932, p. 130. [4] Ibid., p. 125.
[5] The League Year Book, 1932. London: Ivor Nicholson and Watson, Ltd. 12s.

[1] Brain, 1932, lv., 181.

seen in both series. Of the post-variolar cases six occurred in the London area, while post-vaccinal cases also tended to appear in groups.

THE POISONOUS YEW

In our medico-legal column will be found a report of two recent deaths from eating yew leaves. Accidents of this kind are on record at least from the fourth century B.C. onwards, though they are nowadays rare enough to cause surprise. In many European countries yew leaves are believed to be abortifacient, and attempts have been made to use them also for more legitimate medical purposes—e.g., for epilepsy and rheumatism, and as a heart tonic. Mr. T. Bryan-Brown, of the Oxford University Pharmacological Laboratory, has lately examined [1] the properties of the alkaloid taxine, derived from yew, upon rabbits, mice, guinea-pigs, and frogs. It seems fairly well established, he says, that taxine is present in large quantities only in the old leaves and the seeds; the pulp of the berries, which has a pleasant sweet taste, is almost free from the alkaloid, and can be eaten without ill-effects. He found the minimum lethal dose for rabbits, by intravenous injection, to be 0·002–0·003 g. per kg. of body-weight; for mice, guinea-pigs, and frogs the dose ranged from 0·012 to 0·017 g. per kg., being given intraperitoneally, subcutaneously, and into the dorsal lymph sac respectively. The toxicity of the alkaloid is diminished by keeping; after ten months in storage it was found that the minimum lethal dose required to be increased by 60 per cent. The symptoms of poisoning were essentially the same in all the animals used. A few minutes after subcutaneous injection of a lethal dose into a guinea-pig the animal became at first restless, and, after a further few minutes, languid and unwilling to crawl, though able to do so. After another five minutes it tried to lie prone, but was hindered by periodic twitchings of the limbs; it became too weak to crawl, and respiration was slowed from the normal rate of 114 per minute to 90. Violent clonic convulsions presently appeared, at intervals of 10 to 15 seconds, which lasted from two to five seconds and affected the hind limbs especially; respiration was further slowed to 60 per minute. Shortly afterwards respiration became periodic; the animal could not right itself when placed on its side, but the corneal reflex was still present. Respiration later became gasping, the corneal reflex disappeared, and the convulsions became feebler; finally, about 45 minutes after the injection, the guinea-pig died.

The effect on respiration was found to vary in different individuals; frequently the rate was at first accelerated, and periodic respiration, though common, was not a constant sign. The stages succeeded each other more rapidly when the lethal dose was given intraperitoneally, and after intravenous injection the animals collapsed suddenly and died after two or three convulsions; in frogs convulsions failed to develop after the injection of a lethal dose, though the symptoms were otherwise comparable to those found in mammals. A further series of experiments showed that taxine had no effect on the blood pressure if less than one-third of the lethal dose was given. For several minutes after the injection of such a dose the only change was a slight slowing of the heart-rate; then, quite suddenly, the rate would drop to half normal or less, and this drop was frequently accompanied by a fall of about 30 mm. of mercury in the blood pressure. As the heart settled down to the slow rate, however, the blood pressure returned to its normal height. Investigation of the slowing of the heart-rate, by taking simultaneous records of the auricular and ventricular beats, by electrocardiography, and by experiments with isolated perfused hearts, led to the conclusion that taxine probably slows the heart by depressing the whole of the conduction tissue. It was not possible to prove that it had any specific action on the central nervous system. Immersion of the isolated intestine of rabbits and guinea-pigs in a 1 in 100,000 solution of taxine reduced the size of the contractions, and in a solution of 1 in 10,000 they ceased. Injections of two-fifths of the lethal dose into intact anæsthetised rabbits increased the size and frequency of contractions of the uterus.

In man the symptoms of poisoning usually come on in an hour or less, but their onset has sometimes been delayed for several days. They may include convulsions, and loss of consciousness, with dilatation of the pupil, pallor, and coldness of the limbs; vomiting and purging are not uncommon, and there is sometimes abdominal pain. Death, or recovery, usually takes place within eight or ten hours, but people have been known to die as long as 19 days after taking the poison. Signs of severe intestinal irritation are found post mortem, and this irritation is often the cause of death in cattle. Some degree of tolerance can, however, be acquired, and Bryan-Brown quotes a statement that in Hesse the peasants feed their cows on yew in winter, offering them only a very little at the outset and later increasing the amount.

[1] Quart. Jour. Pharm. and Pharmacol., 1932, v., 305.

THE RELIEF OF PAIN IN ANEURYSM

The part which surgery can play in the treatment of diseases of the heart and blood-vessels is gradually becoming clearer. For example, destruction of the dorsal sympathetic rami is now proving superior to operations on the cervical sympathetic chain in angina pectoris, and lately this procedure has also been shown to be useful in alleviating the pain of aortic aneurysm. Usually aneurysm of the aorta does not cause much pain; nevertheless, this is sometimes very severe—even apart from the complication of angina—being probably due to pressure on neighbouring structures. J. C. White [1] reports three cases of this kind successfully treated with paravertebral injections of procaine and alcohol. The technique is similar to that used in the treatment of angina pectoris by paravertebral injections, and the object is to destroy the sympathetic rami communicantes as they pass from the sympathetic ganglia to the ganglia upon the posterior nerve-roots. It requires accurate knowledge of the anatomy of the region, and in describing the technique measurements are of limited value, for they vary very widely with the build of the patient. The most important structure to avoid in making the injections is the pleura. White does not describe his method in detail, but no doubt he uses a manometer in connexion with the needle, so that a warning may be given if the pleural cavity is entered. A preliminary injection of procaine is given to determine which nerve-roots are concerned in the pain, and this is followed by 5 c.cm. of 95 per cent. alcohol into the appropriate nerve-roots. In the three cases described, blocking of two roots only—the first and second dorsal—was required. An anæsthesia of the corresponding intercostal nerve areas is produced, but this never lasts more than a few weeks, while the relief from pain is considerably longer. From this it would appear that the pain impulses are actually carried by the

[1] Jour. Amer. Med. Assoc., July 2nd, p. 10.

sympathetic nerves. The treatment is merely palliative, but it may be found helpful in the later stages of some of the larger aortic aneurysms.

MALARIA IN MONKEYS

In consequence of the discovery of the therapeutic value of inoculated malaria and the elaboration of new antimalarial synthetic drugs, much attention has lately been paid to the malaria-like parasites of birds and monkeys. The more minute morphology of monkey malaria and its transmission through mosquitoes has been studied by R. Green, while an important paper by R. Knowles and B. M. das Gupta has appeared almost simultaneously. For the first time it has been possible by means of this infection to reproduce hæmoglobinuric fever in monkeys, and also to convey the parasite to man.

A malarial parasite was first discovered in the blood of monkeys by Koch in Central Africa in 1898, and in the following year Laveran found similar organisms in the blood of an African monkey, naming them *Plasmodium kochi*. Since that time they have been reported in New World monkeys as well as in the larger anthropoids. In these hosts they closely resemble the subtertian, benign tertian, and quartan parasites of man. Green [1] has now made a close study of the parasite in the blood of the "kra" or crab-eating macaque (*Macaca irus* F. Cuv). As seen in the blood of three naturally-infected and four artificially-infected animals this parasite closely resembles the benign tertian plasmodium of man; indeed, a long comparison has revealed no outstanding difference save that the schizonts of the monkey plasmodium have a smaller number of merozoites—i.e., 16 in comparison to the 24 of *P. vivax*. The parasite is thus identical with *Plasmodium inui*, Halberstdäter and Prowazek (1907). Artificial inoculation of other captive monkeys was performed by intramuscular injection of 0·1–0·25 c.cm. of infected blood and was found successful. The parasite can persist for many months in these monkeys, and the disease runs a benign course. In artificially-infected animals trophozoites persisted over ten months, but gametocytes were not found after the fourth month. The anopheline mosquitoes *A. kochi*, *A. maculatus*, and *A. vagus* readily become infected after being given one feed of parasitised blood. The cycle of development in the mosquito proved indistinguishable from that of *P. vivax*, while the appearance and rate of development of the oöcysts were identical, and the sporozoites resembled those of *P. falciparum* and *P. vivax*. An injection of human blood containing *P. vivax* failed to infect a monkey and afforded some evidence of host-parasite specificity. Obviously the readiness with which anopheline mosquitoes become infected with the monkey parasite should cause difficulty in interpreting dissection results in districts where these insects have access both to monkeys and to man infected with malaria.

Lieut.-Colonel Knowles and Dr. das Gupta [2] began their researches on monkey malaria independently of Dr. Green. The plasmodium with which they worked occurs as a natural infection of the African monkey, *Cercopithecus pygerythrus*, in which, however, the infections are so scanty that the animals usually recover within a few days. This parasite closely resembles *P. vivax*. The Indian monkey, *Macacus rhesus*, on the other hand, is extremely susceptible to it, and mass infection takes place with profound and progressive anæmia. More remarkable too are the morphological changes which take place in the parasite itself, for the early ring and trophozoite phases resemble *P. falciparum* and the gametocytes *P. malariæ*. The infected red blood corpuscles are not enlarged or stippled. The terminal infection in these monkeys was accompanied by hæmoglobinuria (in the absence of quinine), a fact which sheds light on blackwater fever and makes its experimental study in these animals possible. In another species of macaque, *M. radiatus*, the infections are scanty and persist from 5–40 days, the parasite counts are low, and spontaneous recovery is the rule. The morphology of the parasite is intermediate between *P. falciparum* and *P. malariæ*. The hunuman monkey of Assam, *Semnopithecus entellus*, is very susceptible indeed; severe and progressive anæmia soon becomes evident, and the animals die of a secondary lobar pneumonia. *Hylobates hoolock*, the anthropoid of Assam, is only slightly susceptible, and in its blood the parasite resembles *P. malariæ*. This monkey parasite has been successfully transmitted to three human volunteers. In the first a low grade of fever developed with temperature 100·8° F.; after a mild relapse, spontaneous recovery took place. In the second, there was a very severe attack of malaria with temperature rising to 104·2° F., with a sudden drop to subnormal accompanied by extermination of the parasite and spontaneous recovery. In the third, a mild daily remittent fever lasted for four days, being followed by spontaneous recovery. Morphologically the parasites resembled *P. malariæ*. While there is great variation in the earlier phases of the infection in hosts of different species, the mature rosettes are fairly constant in morphology, with about ten merozoites.

These researches open up yet another page in the scientific study of malaria.

[1] Trans. Roy. Soc. Trop. Med. and Hyg., 1932, xxv., 455.
[2] Indian Med. Gazette, 1932, lxvii., 301.

LEAD AND THE NERVOUS SYSTEM

The pathology of lead palsy and lead encephalopathy has long been in dispute. Some years ago J. C. Aub,[1] working with cats, produced evidence in favour of the paralysis being caused by deposition of lead within the muscle; he thought the changes in the central nervous system were secondary. There remained, however, certain cases of widespread palsies which were difficult to explain by this theory; and it has now been shown by A. Ferraro and R. Hernandez [2] that the central nervous system may be primarily attacked in acute lead-poisoning. In their experimental animals they were able to demonstrate, after ingestion or intravenous injection of lead, acute changes in the nerve-cells; indeed all stages from acute swelling and chromatolysis to complete disintegration were found, with little or no change in the peripheral nervous system. The outer layers of the cortex suffered most damage, while the anterior horn cells of the spinal cord were relatively little affected. The vascular endothelium was often swollen, but this was by no means an outstanding feature. Examination of muscles revealed fatty changes, irregularly scattered and unassociated with changes in the nerves during the acute stages, but in a mild intoxication, over a prolonged period, changes in the nerves were to be found. Thus, experimentally, lead intoxication causes a variable picture according to the dosage; with large doses the central nervous system is primarily and most involved, whereas in slower intoxications the lesions may be primary in the muscle with secondary affection of the anterior horn cell. Yet in some animals the two processes appear to go hand in hand.

[1] Medicine Monograph, 1926.
[2] Psychiat. Quart., 1932, vi., 121, 319.

SPECIAL ARTICLES

MENTAL HEALTH IN 1931

REPORT OF THE BOARD OF CONTROL

(*Continued from p. 470*)

IN reviewing last week the earlier sections of the 18th annual report of the Board of Control, stress was laid on the remarkable reform brought about by the beneficent introduction of voluntary and temporary treatment. The old system seemed to postpone remedial measures until mental disease reached the advanced stage of certification. The new method seeks to apply treatment at the outset and to encourage patients to take advantage of it without the stigma of being certified.

Voluntary Patients

Unfortunately the new Act began to operate in a period of financial crisis when all health services have been slowed down. The notorious shortage of accommodation remains acute, and research, which some day may provide definite prophylaxis, has been held back, though the Board's report summarises much promising work of this nature. Apart from the restrictions of economy, local authorities have not always been prompt to realise their new powers and duties. If a good start has been made in some areas, we learn that in the Lancashire Mental Hospitals Board area not a single temporary patient was admitted to a public mental hospital in 1931. In general, among private patients the voluntary and temporary admissions exceeded those under certificate, but it will be regrettable if the benefits of the Act seem to be restricted to the well-to-do. In guarding the citizen's personal liberty Parliament was moved to insist that two medical recommendations should be required before a temporary patient could be admitted. Either the second fee or else ignorance of the facilities given by the Act seems to be obstructing the temporary admission of rate-aided patients. Voluntary admissions make up 65 per cent. of the patients received in registered hospitals and 50 per cent. of those admitted to licensed houses; but the figure for the county and county borough mental hospitals is no higher than 7 per cent.

Good progress is reported in the creation of a network of out-patient clinics to which a corps of trained social workers should be attached. Where voluntary hospitals are available, says the Board, no better centre could be found. In such cases, when action is taken under Section 6 (3) (*a*) of the Act to establish a centre for nervous and mental cases in the hospital's out-patient department, the Board suggests that an honorary physician should be placed in charge to mark the importance of the work. These centres are intended to take the following classes: neurological and psychoneurotic cases; mental disorder cases where it is hoped that the family doctor will learn to appreciate the value of the centre's advice, especially in the early stages; patients absent on trial from mental hospitals; persons who after a previous attack have been taught to recognise the symptoms of possible relapse and the need of advice; mental defectives; mental retardation cases; child guidance cases; and cases of delinquency or others in which the courts desire help. The Board observes that no general hospital should exclude either from its wards or its out-patient department the treatment of mental illness. Every out-patient department should have a section for nervous and mental cases. The work in this section should be shared by the medical staff of the mental hospital to which many of the patients will probably go.

STAFFING OF HOSPITALS

The Board is anxious to dispel any impression that the staff of public mental hospitals must have a monopoly of clinical work in mental treatment; but naturally the arduous and exacting work of psychotherapy requires special experience and qualifications which not every private practitioner possesses; moreover the advantages of continuity of treatment are obvious. This topic leads on to a discussion of the value of modern psychotherapeutic methods. The Board disagrees with those who can discover nothing new in the technical skill which modern analytic and re-educative methods imply. It disagrees also with those who, admitting the advance, deny its utility in mental hospitals. The Board thinks that more frequent and longer heart-to-heart talks between patient and doctor will discover more patients whom the new methods will benefit. The Mental Treatment Act will bring in as voluntary patients many cases of "nerves" which admittedly improve under the new "psychological medicine." While it deprecates exclusive specialisation, the Board hopes to attract to the mental hospital service those doctors who are at pains to learn modern psychotherapeutic measures.

Mental Deficiency

The serious lack of accommodation in many mental hospitals is to a great extent due to the presence of large numbers of mental defectives, 10,000 of whom, on a conservative estimate, are still housed in mental hospitals, although it would be much better for everybody concerned if they could be placed in a colony. It is the Board's policy to deprecate the expensive and ineffective use of mental hospital beds for defectives unless this measure is necessary for medical reasons. The Board maintains that the cheapest remedy for overcrowding would be to provide inexpensive villas in colonies for the accommodation of young mental defectives and to transfer the older ones to public assistance institutions. The number of colony beds added during the year was only 2412, though this compares very favourably with the total of 917 for the previous year. The Board urges authorities to get villas built at all costs, even if accessories like an assembly-hall have to wait for better financial times. Local authorities have continued to show a realisation of the need; 44 estates have now been acquired for the purpose of developing colonies which will serve the needs of 77 areas, and nine authorities have agreements with philanthropic institutions. In all, some 105 county councils and county boroughs have taken active steps or are seriously considering schemes for their defectives. The report publishes a "black list" of 20 authorities who have not done anything. Only one new hostel has been opened during the year, but the existing ones continue to play an active and important part in the scheme. Owing to the difficulty of securing adequate nursing and teaching in small private homes, the Board is discouraging the further development of these institutions, unless a high standard can be maintained.

The restriction of capital expenditure makes it all the more important for local authorities to develop

community care and employ trained supervising officers and day training centres, the cost of which is small compared with that of a colony. The Wood Committee estimated that two-thirds of the mentally defective population could live in the community if adequate provision were made for their care, training, and protection. The Board discusses the various forms of community care and the precautions that should be taken to ensure its success. There were on Jan. 1st this year 1503 defectives on licence, an increase of 176 on the previous year, and 2147 under guardianship, an increase of 315. The Board is glad to see that guardianship cases are increasing, and thinks that it would be possible to find more suitable guardians if the difficulties were explained by an experienced supervising officer. The Board estimates that perhaps 1 in 36 of all defectives ascertained are suitable for guardianship. The number of cases under statutory supervision was 27,970, an increase of 2360 during the year, while those under voluntary supervision numbered 21,079.

The Board records with gratification the inception of research work under the Darwin Trust at the Royal Eastern Counties Institution, and also the systematic physical examination of patients at Stoke Park Colony. Visiting consultants to the State Institution at Rampton have shown that marked improvement in conduct and self-control can be brought about by treatment of eye, ear, nose, and throat conditions. The report remarks that it is of the greatest importance that the six-monthly examination enjoined by the regulations should be strictly observed, as early disease is very largely unnoticed among defectives.

MARRIAGE AND STERILISATION

During last year 166 marriages were reported to the Board, and 103 children are known to have been born to married defectives, while 177 illegitimate children of defective mothers were reported. Since ascertainment is still very far from complete, these figures represent probably only about half of the actual number. There are still eight authorities whose ascertainment figures are less than 1 per 1000 of the population, while the highest ratio—that of Cardigan—is 7·23 per 1000. The report points out that before the marriage of defectives can be prevented the defectives must be ascertained, and often ascertainment is only effected after marriage. Often, when defectives marry, the supervision and control which enable them to lead harmless and useful lives are removed and they sink back into a state of dependence or perhaps become delinquent. Yet when defectives assume the responsibility of a household and a family they and their children are in more need of supervision and care than ever before. As the law stands, the Board is faced with the alternative of discharging them or forcing them back into an institution. Reluctantly the Board has come to the conclusion that if defectives are trained to partial self-support and sent out free to marry, the community is likely to have more marriages than if the defective had been untrained and had drifted into complete dependence at an early age. The Board has in the past steadfastly opposed sterilisation, but this year it says that it is glad to report that the Minister of Health has approved the appointment of a committee to consider this subject.

DELINQUENCY

A report has been drawn up on 306 mental defectives who committed crimes during the year 1931, and who were dealt with under the Mental Deficiency Act. The incidence of crime reaches its highest point between the ages of 14 and 21, and then steadily decreases. Possible reasons for this are that the mental defective youngster is more easily caught than his sharper brother, that he is less able to find sensible amusement for himself, and when school is over is more likely to be out of work, that he is excluded from the clubs and societies of his contemporaries and left inactive with a feeling of inferiority, and that, after once being before the court, mental defectives are placed under permanent care or drift into poor-law institutions, and so do not continue a life of crime. Only 18 per cent. of the cases under review had been ascertained. Sixty-three of them had been in prisons or institutions of some kind, but their defect had either passed unnoticed or not seemed to be a bar to their discharge. Yet most of them were of medium grade and their defect ought to have been obvious from childhood. The great majority of cases were at once detained under the Mental Deficiency Act, and it is difficult to see why some of the others were first submitted to a period in prison. The crimes ranged from murder to simple larceny, and included a high proportion of sexual offences.

MEDICINE AND THE LAW

Accident Within the Meaning of the Act

AN important decision in the Newport County Court this year has shown that the perforation of a gastric ulcer may be an "accident" for the purposes of the Workmen's Compensation Act. While it is not unlikely that the case may be taken further, the decision appears to follow principles already established by judgments of the House of Lords. The applicant was the subject of a chronic gastric ulcer. At the moment of the occurrence on which the claim was based, he was working at a furnace, using a long-handled, heavy "scraping" tool. Apparently this kind of tool occasionally breaks—a fact which suggests that the force required for its use may involve great variety of effort. The workman complained suddenly of an agonising pain in his left side; he lay down for an hour, then, feeling better, was helped to an omnibus and so found his way home. A doctor who attended him thought it possibly a case of diaphragmatic pleurisy. The patient died that evening. A small gastric ulcer, about the diameter of a lead pencil, was found to have perforated. The edges were steep and punched out, showing no signs of healing. It had eaten through the three coats of the stomach; only the thin peritoneal covering remained; this, apparently under the strain of abdominal muscle movement in using the scraper, had at last given way, pressure being raised by the distending of the stomach after a hearty meal of tea, eggs, and bread and butter. The employers, respondents to the claim, took the points that no vomiting had occurred, and that the man had managed to find his way home. Vomiting, however, is not an essential concomitant of perforation, and the man's successful effort in getting home was presumably possible during the latent period in which for an hour or so the patient experiences a comparative freedom from pain. His Honour Judge L. C. Thomas, without calling on the applicant's counsel to reply, held that the fatality was an "accident," and awarded full compensation. The fact that the fatality was due to the perforation of the ulcer seems to have been hardly disputable. The only question therefore was whether an occurrence which presumably must have happened sooner or

later in the course of nature, and which would not necessarily have happened in the course of his work, was an accident within the meaning of the Workmen's Compensation Act.

Previous decisions give a clear guide. It is true that in Hensey *v.* White (1900), where a workman, not physically sound, strained himself in turning the wheel of a machine, it was ruled that death was not due to "accident." But in Fenton *v.* Thorley, Ltd. (1903), where the workman was similarly employed in turning a wheel and by miscalculation of his strength over-exerted himself and ruptured himself, the injury was finally held to be an "accident." The Court of Appeal thought that, if a man met with a mishap in doing the very thing which he meant to do, the occurrence could not be deemed accidental. But the House of Lords, at last discarding the idea that "accident" in this connexion connoted something fortuitous, overruled several previous decisions and interpreted the word in its ordinary and popular sense. In 1910 the Act was held applicable to a case (Clover, Clayton and Co. *v.* Hughes) where a workman, suffering from an aneurysm so advanced that it might have burst during sleep or upon very slight strain or exertion, died from rupture of the aneurysm while tightening a nut with a spanner. About six turns with the spanner would have been required; only two turns had in fact been given. Sir John Simon, for the employers, used the arguments which had failed in Fenton *v.* Thorley, Ltd. The claimant, he said, must show that there was some mishap independent of the injury and causing it; it was not enough to say that he died because he was at work; the Act said "injury by accident," not "injury while at work." Lord Atkinson took the employers' side on the ground that the third turn of the spanner was but a slight exertion in the deceased's employment, not sudden, not severe, not unexpected. Lord Shaw took the same view, declining to apply the word "accident" to the necessary and ordinary effect upon a man's constitution of the work in which he is engaged day by day. The majority decision of the House of Lords, however, was in the workman's favour. The state of the man's health was immaterial; there is no statutory standard for the general health of workmen within the Act. The work of tightening the nut was ordinary work, but it was too much for the particular workman. The man, in a graphic phrase of Lord Robertson quoted by Lord Macnaghten, "broke part of his body." He did not mean to do it. If a man miscalculates his powers, said Lord Macnaghten, and so fails in what he attempted to do and perhaps injures himself, he has probably plenty of friends who will tell him afterwards that they knew exactly what would happen; but that does not prevent the untoward occurrence from being popularly called an accident.

The recent case of the gastric ulcer is the most striking application of the principle for the past twenty years. In Barnabas *v.* Bersham Colliery (1911), where a miner with unsound arteries died from apoplexy during working hours underground, the claim for compensation was disallowed in the absence of evidence connecting the attack with the strain. That decision is a reminder that a great deal depends on the findings of fact in the county court. But the key to the legal position is that it is immaterial that the occurrence would not have caused death or incapacity to a stronger man. It is immaterial that the workman had some latent weakness or defect, which, when combined with the occurrence, caused death or incapacity. In Clover, Clayton and Co. *v.* Hughes, Lord Loreburn definitely rejected the argument that the court should ask itself whether a doctor acquainted with the workman's condition would have expected what occurred. Were that the right view, he said, then it would not be an accident if a man liable to fainting fits fell in a faint from a ladder and injured himself. It was true that the ordinary accident was associated with something external, a mine explosion, for instance, or the bursting of a boiler. But "accident" might flow from internal as well as external conditions. "It may be something going wrong with the human frame itself, such as the straining of a muscle or the breaking of a blood-vessel."

Mental Patients Die from Eating Yew Leaves

In two different institutions lately a mental patient has died through eating yew leaves. The first case was investigated at Camberwell by the deputy coroner on August 16th. The patient had suffered from a nervous breakdown last February and had attempted to drown himself three months later; he subsequently agreed to become a voluntary patient at a mental hospital. Here he slept on a veranda fronting a lawn where there was a large yew-tree. Post-mortem examination showed a quantity of yew leaves in his organs; death was due to poisoning therefrom. Leaves were found in his dressing-gown. The deputy coroner observed that the man had been getting better and had written cheerful letters to his wife. A witness had said that the patient was cultivating the habit of chewing leaves to supersede the habit of smoking, which he had promised his wife to sacrifice. His behaviour was normal and he had a meal before his collapse. The jury returned a verdict of "Death by misadventure," adding a rider that all bushes, shrubs, and trees like the yew should be removed from grounds to which mental hospital patients had access. Within a fortnight a second death of this kind was investigated at an inquest at Battersea. A woman, aged 63, was taken ill after walking in the grounds of a mental hospital. The left side of her face slowly became paralysed and death was found to be due to alkaloid poisoning, post-mortem examination showing several yew leaves in the stomach. A verdict was recorded that the patient "killed herself while of unsound mind."

The poisoning of human beings by eating the leaves of the yew has been less familiar to the law than similar injury to animals. Several legal decisions are recorded over the death of horses and cattle, with special reference to the duty of an occupier of land to prevent damage to his neighbours from the presence of dangerous things on his land or in his hedges. Thus in Crowhurst *v.* Amersham Burial Board (1878) the defendants were held liable when the plaintiff's horse was poisoned by eating branches of a yew-tree planted so near their boundary that it projected into the horse-owner's meadow. On the other hand, in Wilson *v.* Newberry (1871) a land-owner was held not liable when clippings from his yew-tree found their way by some unexplained means into his neighbour's field with fatal results to the latter's cattle. And in Ponting *v.* Noakes (1894) it was ruled that if there is no obligation to fence against cattle, there is no liability when the cattle trespass and eat poisonous leaves. This part of the law is based on the principle that a man acts at his peril if he keeps something on his land which, if allowed to get out of control, is likely to do injury—an artificial lake for instance, which may burst and flood adjoining land, or a savage tiger which may escape. The legal cause of action is negligence. The cause of action may be different where there is an element of contract between the parties—for instance, if a land-owner agrees for gain

to allow cattle to pasture in a field which to his knowledge contains poisonous plants. Where a question of this nature arose in litigation over the death of a school-child or a mental patient from eating poisoned leaves or berries, the issue would be whether a reasonably careful school or hospital would have allowed the injured person to be exposed to the risk. Hitherto the risk has hardly been appreciated. At the Camberwell inquest the deputy medical superintendent of the hospital stated that neither he nor any member of the medical staff was aware that the tree in question was a yew. And, as the deputy coroner remarked, it is not widely known that the leaves of the tree are poisonous to human beings. In the face of these two recent deaths, however, it will hardly be possible for hospital authorities in future to escape liability on the ground that the risk was so novel that they could hardly be expected to take precautions against it.

IRELAND

(FROM OUR OWN CORRESPONDENT)

DEPARTMENT OF JUSTICE AND THE HOSPITAL SWEEPSTAKES

THE Department of Justice of the Irish Free State has issued a statement explaining why it has not been possible as yet to distribute the funds accruing from the Manchester November Handicap. It is pointed out that under the Public Charitable Hospitals Amendment Act, 1931, a committee of reference should inquire into the needs and circumstances of the institutions participating in the proceeds of sweepstakes, and report to the Minister for Justice as to the manner in which the proceeds should be allocated. While the responsibility for distribution rests on the Minister for Justice, he is bound by the Act to consult with the Minister for Local Government and Public Health before he gives his final decision. The Minister's anxieties in the matter are to secure: (1) that a fair distribution will be made amongst the hospitals, and (2) that the moneys so distributed will be used to the best possible advantage. As the report of the Committee of Reference occupies some 145 pages of print, its consideration by the departments concerned could hardly be completed in a short space of time. Moreover, a complaint as to the basis of distribution was received from one of the participating institutions and had to be investigated. Should the complaint be justified, readjustment of the several proposed awards would be required. In order, however, to meet the more pressing demands of some of the hospitals, the Minister had authorised the payment of one-third of the recommended award to each institution. The balance will be distributed when the Minister has come to a decision as to whether the recommendations of the Committee require alteration to meet the case of the institution which has lodged a complaint.

The defence of the department against criticisms—which, unfortunately, have not been confined to an irresponsible press—appears complete. The department goes further, and offers advice which may be regarded as warning. It draws attention to the comments of the Committee of Reference on the lack of consideration and the undue haste shown by certain institutions in launching out into extensive building projects:—

> "The Minister is satisfied that it is advisable that institutions should proceed with caution, and that they should await the development of sweepstakes, so that they may be able to form a reasonable estimate of the total sum which they are likely to receive before embarking on ambitious enlargements."

The care exercised by the Committee of Reference and by the Minister for Justice deserves the respect and gratitude of all those interested in the solution of the hospital problem as a whole, and not merely on the supposed welfare of a particular institution. One can only regret that a similar caution, and a similar determination to take a long view, did not characterise the sweepstakes' movement from the beginning.

MEDICAL REGISTRATION OF THE IRISH FREE STATE

No other candidates having been nominated, the two previous Direct Representatives of the registered medical practitioners, Mr. William Doolin and Dr. Robert J. Rowlette, have been reappointed as members of the Medical Registration Council of the Irish Free State.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

VENEREAL DISEASE IN SAN FRANCISCO

A SURVEY of the incidence and control of syphilis and gonorrhœa in San Francisco[1] shows that the number of cases under treatment on a selected day was 113 per 10,000 population (syphilis 62 and gonorrhœa 51). Four-fifths of the male patients and two-thirds of the female were unmarried. More than 90 per cent. of the males reported "prostitute" as the source of infection. From 1925 to 1930 California spent less than $6000 for venereal disease control and $128,710 on tuberculosis. On the other hand during a five-year period 113 cases of neurosyphilis were admitted to a single institution, and their care is estimated to have cost the taxpayers $131,000. Treatment is given in a social hygiene clinic which is largely supported by fees paid by patients in the higher wage group. Ninety-four per cent. of the patients in this wage group are prostitutes. During the year ending June 30th, 1931, 2334 cases were registered (961 males, 1373 females). Only 63 (3 per cent.) were dismissed as "probably cured" during the year. Nearly half the cases became deserters. A diagnostic clinic functions in connexion with the city jail. In 8071 examinations 66 per cent. were found to have gonorrhœa, 26 per cent. syphilis. Twenty-two per cent. of those infected were committed for treatment to ward L of the San Francisco Hospital. What became of the other 78 per cent. is not known. Ward L is said to be "a gloomy, crowded place, filled far beyond its normal capacity." Prostitutes dread being sent there. Although in five years this ward cost the city $154,562, "little permanent benefit resulted to the individual or to the public by the average amount of treatment administered to these women. In some cases it is possible that actual damage was done."

California law prohibits the diagnosis and treatment of venereal disease except by licensed practitioners of medicine. However, a provision in the Medical Practice Act reads "Nor shall this Act be construed so as to discriminate against any particular school of medicine or surgery, or any other treatment, nor to regulate, prohibit or apply to any kind of

[1] Medical Aspects of Social Hygiene in San Francisco. By Dr. W. F. Snow and Dr. Walter Clarke. American Social Hygiene Association, 450, Seventh-avenue, New York City.

treatment by prayer, nor to interfere in any way with the practice of religion." Of 445 young men interviewed casually in the street, 6 per cent. recommended a herbalist, while no less than 36 per cent. recommended a drug store for the treatment of venereal disease. Only 41 per cent. recommended either a physician or a clinic.

THE ECONOMIC DEPRESSION

A cloud no bigger than a man's hand gives promise that relief from the economic drought may at last be on the way. It will come, if it does, only just in time for the preservation of our health. In the last few months the effect of the economic condition upon medical service has been felt with accelerated acerbity. County doctors who even last winter could collect fees from half of their patients are now able to collect scarcely any fees at all. Recent statistics from the Children's Bureau of the Department of Labor prove that there was a well-defined increase during 1930 and 1931 of dependence upon free clinics for medical and dental care. The bureau now makes this significant announcement: "Recently, however, there is indication of a strong tendency toward a lessened rate of increase, apparently directly related to the curtailment of clinic service by agencies operating under reduced budgets." One wonders whether the startlingly rapid increase in mortality from cancer, observed this year by the Metropolitan company among its industrial policy-holders, can be related to an increasing hesitancy to call for medical and surgical aid when the patient and his family are without means or prospect of means for recompensing it.

PANEL AND CONTRACT PRACTICE

Scottish Sickness Statistics

THE Department of Health for Scotland have now issued a second and much more elaborate study of sickness incidence among insured persons; the first was published in their annual report for 1930, in which, also, were given details of the methods employed to obtain exact results. This second study (H.M. Stationery Office, pp. 39, 9*d*.) is a well-loaded document and, as it seems to be the first of its kind issued, it deserves the most careful scrutiny. The qualifications that have to be made throughout the report show how difficult it is to get precise results in a body of facts so complicated. The primary purpose of the inquiry was (*a*) to provide information that would be of service in the examination of certification experience—a very acute and important problem; and (*b*) to secure the data essential for the elucidation of the problems relating to the incidence and severity of disease in the Scottish insured population. This involved the coding of diseases, which is necessarily more or less arbitrary, but is here based on summary card returns of sickness for the previous year. Two major difficulties were encountered: the best method of assigning sickness where two or more joint causes are certified, and the way of dealing with cases where the cause of sickness given is really only a sign or symptom.

As a test of certification, a careful comparison is made as to the factor of competition—to what extent it affects number of first and final certificates. Figures are given for partnerships versus single doctors.

This study is carried out for every insurance area in Scotland. Six tests are applied: average duration of terminated incapacity; number of first certificates as percentage of panel; number of incapacities current during whole period as percentage of panel; live register at June 1st, 1930; the same at Jan. 1st, 1931—the period selected; number declared capable as percentage of cases referred to regional medical officers.

"Considering the aggregate result for counties, partnerships certainly do not show a worse record in respect of the factors examined. In burghs, the comparative results for partnerships are even more favourable than were found in counties."

A special study is made of the effect of competition on certification. The view has been put forward that "competition with free choice of doctor may be one of the factors conducive to excessive issue of certificates, to undue prolongation of the period over which incapacity is said to exist, or to both."

The Highlands and Islands schemes are here considered; but, on the whole, the small differences found are "sufficient to engender a doubt as to the importance of the competition factor," especially in the highland and island area. It is, of course, agreed that the suggestion is suitable for inquiry.

The day of issue of certificates (both first and final) of incapacity is fully investigated; but the final significance of the facts is not yet disposed of. Mondays are predominant for first certificates (29·35 per cent. of whole); Mondays and Saturdays for final certificates (17·74 per cent. and 45·16 per cent. respectively). The results are based on an analysis of 10,220 certificates.

A rather exceptional phenomenon—the excessive sickness incidence of Paisley textile workers—is subjected to a careful analysis and comparison with all other textile workers in Scotland. Whether considered in disease groups or individual diseases, Paisley shows unfavourably in all but one group. One important point emerges—namely, among the Paisley workers, "a greater proportion than among other textile workers of cases of sickness assigned to causes which are short-term illnesses." The difference between the statistical effects of short-term and long-term illnesses is explained in another part of the report. It is a matter of importance in such an investigation as this. The feature of the Paisley case is a higher incidence with lower average duration of completed incapacities. The chief causes of sickness were accidents, inflammatory and suppurative conditions of skin and subcutaneous tissues, specified skin diseases, influenza, and minor diseases of the upper respiratory tract.

An elaborate table is given for all Scotland showing the incidence of incapacity by cause and sex. This will receive prolonged scrutiny by every health statistician. It brings out some surprises as between sexes.

"For all women irrespective of marital status . . . the incidence of completed incapacities, 232 per 1000, is 13 per cent. in excess of the corresponding figure for men. For the whole Scottish insured population there was the equivalent of just over 20 per cent. of them with incapacities terminating during this period."

The larger tables constitute a highly important first analysis of incidence and duration of incapacities, with some geographical indications of distribution. Some hints are given of additional studies now under way. The Department are to be congratulated on so solid a piece of original work.

A Pension and Insurance Scheme

For 16 years or more the British Medical Association has been considering how best to protect insurance

practice against penury in old age and the risk of accident in middle life. Various plans were discussed at panel conferences from 1919 to 1921; and in 1922 a proposal was discussed for inclusion of a pension scheme in the terms of service made with the Ministry of Health. In the following year the Insurance Acts Committee reported its finding that no pension scheme properly so called was practicable, and that the only plan which could be considered fair to all participants would be one based upon the principle of deferred pay. This the delegates were unwilling to consider. Last year the conference turned down a proposal to use defence trust funds for pensioning aged or infirm practitioners. Not discouraged, the I.A.C. continued to explore various possibilities, and in its report [1] for 1931–32, definitely gives its opinion against the deduction of insurance premiums from the practitioner's quarterly cheque, and finds the ideal manner for the individual practitioner to provide for old age and dependants in a with-profit endowment life assurance policy. Obliged, however unwillingly, to accept the fact that many practitioners will not make or have not made provisions in this way, the I.A.C. has invited a number of commercial assurance companies to submit schemes which would confer the following benefits :—

(1) A cash payment of £2000 or, alternatively, an annuity of £200 at the age of 65 years.

(2) An annuity in the case of permanent incapacity or breakdown.

(3) Family benefit on death before 65, consisting of an annuity of £100 up to the 65th birthday of the dead practitioner, together with cash payment at death on a specified schedule.

(4) Guaranteed periodic surrender-values.

Three companies—namely, the Legal and General Assurance Society, Ltd., the Medical Sickness, Annuity and Life Assurance Society, Ltd., and the Yorkshire Insurance Company, Ltd.—have submitted quotations, and policies on these terms will be available at any time during the next ten years to any male practitioner who can complete the proposal form satisfactorily to the office; it is hoped to make arrangements whereby the insurance committee deducts the amount of the premium from the quarterly panel fees. The premium for this benefit varies from £36 8*s*. at the age of 25, £43 4*s*. at the age of 30, £53 at the age of 35, up to £199 8*s*. at the age of 55. Half this benefit is taken as the unit and a member is at liberty to take any number of units up to five. The following is an example of what such a form of insurance may mean in a particular case.

A member enters at the age of 30 and completes a proposal form satisfactorily to the insurance office. He elects to take two units of benefit at an annual contribution of £43 4*s*. On the anniversary of entry to the scheme nearest to attainment of age 65 he may take either a cash sum of £2000 or a pension of £200 per annum, which will be payable for a minimum period of five years, and continue for the remainder of his life. In the event of his death between the ages of 65 and 70 the pension will continue to be paid to his representatives for the remainder of the five years, or it may be commuted for its equivalent cash value.

In the event of the member becoming totally incapacitated at the age of 50, at the end of six months' incapacity the premiums will be suspended and there will be payable to him by monthly instalments an annual sum of £200 till he recovers or attains the age of 65, when his normal pension of £200, guaranteed for a minimum period of five years, will become payable, or the alternative cash sum of £2000.

In the event of the death of the member at the age of 50 there will be payable to his representatives £100 per annum for a term of 15 years certain, and a cash payment representing a return of his contributions towards his own pension with interest thereon, amounting to £709.

All three companies have undertaken to submit proposals for somewhat equivalent benefits for women practitioners.

[1] See Brit. Med. Jour., August 20th, Suppl., p. 143.

New Statutory Rules

Some of the new regulations just issued (Statutory Rules and Orders, 1932, No. 561. H.M. Stat. Office. 1*d*.) are of interest to insurance practitioners. Arts. 3 and 4 remove the doubt whether a locum tenens or other deputy can accept insured persons on behalf of the practitioner for whom he is acting. Art. 5 facilitates the transfer of patients when a practitioner reduces the number of insured persons on his list, on ceasing to employ an assistant or on entering into partnership. Art. 7 allows practitioners who have been and are no longer on the panel to be nominated by the Insurance Acts Committee to serve on the advisory committee. Art. 9 makes it possible for a practitioner to issue an intermediate convalescent certificate if the insured person is incapable for 28 days continuously, even though he has not been attended during this period by that practitioner. Art. 10 extends the list of appliances in the second schedule to include cellulose tissue and wadding, elastic adhesive bandages, sphagnum moss, tampons, and zinc paste bandages. Art. 11 includes the reagents, Fehling's solution and Benedict's solution, in the schedule as part of medical benefit.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lts. J. G. Paley to *Vivid*, for R.N.B., Devonport; and H. J. McCann to *Victory*, for Haslar Hospital.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. R. W. H. Tincker to *Malaya*.
Surg. Lt. A. C. Howard to *Victory*, for R.N.B.
Surg. Sub-Lt. B. R. Alderson to *Victory*, for Haslar Hospital.
Proby. Surg. Lts. W. H. Carr to *Victory*, for Haslar Hospital; F. T. Land to *Renown*; W. H. Carr to *Exeter*; and K. Forsythe to *Rodney*.
Surg. Lt. R. S. Allison promoted to Surg. Lt.-Comdr.
Surg. Lt. E. I. Puddy to be Surg. Lt.-Comdr.
Surg. Sub-Lt. R. H. Berry promoted to Surg. Lt.
Surg. Sub-Lt. J. P. Blaiklock to be Surg. Lt.
Proby. Surg. Lts. G. C. Martin and G. H. Sellers to be Surg.-Lts.

ROYAL ARMY MEDICAL CORPS

Lt. (on prob.) H. B. Wright is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.
Lt. G. A. M. Knight relinquishes his temp. commn.

SUPPLEMENTARY RESERVE OF OFFICERS

Lt. C. D. Evans, from Supp. Res. of Off., R. Sussex R., to be Lt.

TERRITORIAL ARMY

Maj. L. H. Taylor to be Lt.-Col. and to comd. 131st (Home Counties) Fd. Amb.
Lt. C. R. Croft to be Capt.
The King has conferred the Efficiency Decoration upon Lt.-Col. Hubert Tunstall Bates.
Supernumerary for service with O.T.C.: F. L. Ker (late Offr. Cadet, Staff Serjt., Edin. Univ. Contgt., Sen. Div., O.T.C.) to be Lt. supern. for serv. with Med. Unit, Edinburgh Univ. Contgt., Sen. Div., O.T.C.

INDIAN MEDICAL SERVICE

Lt. E. A. Y. Mackeown to be Capt.
Lt. (on prob.) V. Srinivasan to be Capt. (on prob.).
Capt. W. F. Cooper, from R.A.M.C., to be Capt.
Maj. G. Shanks retires.

A TRADE-UNION CONVALESCENT HOME.—Last week Mr. Ernest Bevin, general secretary of the Transport and General Workers' Union, opened a new wing of the Union's convalescent home at Littleport, in the Isle of Ely. The building, which stands in 25 acres of farm land from which food-supplies are drawn, now accommodates 90 patients, and is maintained by the contributions of members of the Union.

CORRESPONDENCE

THE INCREASE IN ARSENIC-RESISTANT SYPHILIS

To the Editor of THE LANCET

SIR,—Dr. Sequeira's letter in your issue of August 20th assumes, as does the original article by Drs. Drake and Thomson,[1] that the standard treatment for early syphilis adopted in the department of syphilis at King's College Hospital is in accordance with modern standards of adequacy.

A perusal of that article shows that the routine course for, say, sero-positive primary syphilis consists of but four intravenous injections of neo-arsphenamine (0·75 g. each) at intervals of three weeks and therefore extending over a total period of 12–13 weeks. In addition there is continually administered hyd. cum cret. for a minimum period of two years. The mercury is continued for one year after the blood Wassermann has become negative. If, during the third year, the serology is negative and there are no clinical signs, the patient is regarded as cured. The arsenical therapy is thus negligible so far as real attack upon the *Treponema pallidum* is concerned. By no stretch of imagination can this be considered adequate treatment. The only effect of giving 3·0 g. of neo-arsphenamine in twelve weeks is the very certain one of transforming an early and superficial syphilis into a late and visceral one. Not only that, but if there exists any really potent recipe for inducing arsenic-resistance in the parasite of syphilis, such dosage at such intervals is assuredly it. All that the oral administration of mercury can do under the most favourable circumstances is to keep the clinical signs of endosyphilis below the horizon and the unprovoked serology negative for a period of years.

In the ten cases quoted by Drs. Drake and Thomson the patients all developed gummata of the throat and skin within twelve months of commencing treatment for early syphilis. That fact alone must suggest that the cause of the manifestations recorded by Drs. Drake and Thomson is to be found in the character of the treatment given. Inadequate treatment, whether it be by arsphenamine or bismuth—for mercurial therapy can never be adequate—must inevitably raise the resistance of the *Treponema pallidum* to the agent concerned.

Another vital point is that although Drs. Drake and Thomson—and seemingly Dr. Sequeira also—are satisfied with the efficiency of that routine treatment in the past, it is quite obvious that the standard of cure adopted, and upon which their satisfaction is based, is much lower than modern syphilology demands. These authors rely upon the unprovoked blood Wassermann and absence of clinical signs. No mention is made either of corroborative tests of greater sensitivity such as the Kahn and the Meinicke, nor of any provocative measures. No allusion is made to cerebro-spinal fluid examinations, although, as is well known, that fluid shows abnormalities very early in the course of the disease. The dermatologist is very apt to base his optimistic view of the cure of syphilis upon the absence of cutaneous signs over an observation period of two or three years. This is due to a non-recognition of the fact that syphilis is not a cutaneous disease but is a general infection of the cardiovascular system.

Dr. Sequeira assumes that syphilis was decreasing in severity prior to the introduction of the arsphenamines, and he implies that it has increased in virulence since that time. In the days before Ehrlich's discovery there may have been a diminution in the number of severe *cutaneous* manifestations of the disease—that is, of superficial or trivial syphilis—but coincidental with that, there was a marked increase of visceral syphilis, particularly of the cardiovascular and central nervous systems. An examination of the statistics provided by the Registrar-General will demonstrate this. The great danger at the present day in the treatment of syphilis is that by the misuse of arsphenamine and bismuth and the continued use of mercury inadequate treatment occurs with, as a consequence, an increase in the incidence of visceral syphilis which for many years may present neither clinical signs nor a positive unprovoked serology. The early occurrence of gummata in the ten cases quoted by Drs. Drake and Thomson was indeed fortunate for these patients; otherwise they might have progressed for years without treatment until such time as tabes, paresis, or aortitis appeared.

It is surprising to find at the present day, as is shown both by Dr. Sequeira's letter and by the article of Drs. Drake and Thomson, that there still exists the idea that the severity of syphilis varies directly with the severity of the cutaneous signs. If anything, the reverse is the case. The authors of the original article say that "it is interesting to note that there appears to be no direct relation between the 'strength' of the Wassermann reaction and the severity of the symptoms." Of course not!

I have repeatedly made the plea that the time has come when there should be some authoritative statement as to what constitutes adequate treatment for early syphilis, and so I therefore heartily endorse the last paragraph in Dr. Sequeira's letter. An examination of the routine courses for early syphilis held at King's College Hospital, at St. Thomas's Hospital, at Edinburgh Royal Infirmary, and at Salford Municipal Clinic shows that the last three are of tremendous intensity when compared with the first. The last three differ in detail and perhaps in principle, but they have these things in common: high efficiency indices; replacement of mercury by bismuth; very stringent criteria of cure; and no cases recorded such as those occurring at King's College Hospital. Everything goes to show that a less intensive degree of therapy is insufficient. I have suggested a method[2 3 4] which works perfectly in practice whereby therapy may be assessed and a line ruled which enables one to say that treatment which falls below that line is definitely inadequate.

I am, Sir, yours faithfully,

E. TYTLER BURKE.

City of Salford Municipal Clinic, August 27th, 1932.

[1] Drake, J. A., and Thomson, M. S.: A New Phase in Early Syphilis, Brit. Jour. Derm. Syph., June, 1932, p. 297.

[2] Brit. Med. Jour., 1931, i., 306.
[3] THE LANCET, 1931, i., 1127.
[4] Amer. Jour. Syph., 1931, xv., 155.

ASSOCIATION OF ANÆSTHETISTS OF GREAT BRITAIN AND IRELAND

To the Editor of THE LANCET

SIR,—At a meeting of about 70 anæsthetists, held in London on July 1st, a new independent society of anæsthetists was formed, the object of which is to promote the development of this branch of medicine. Eligible for membership are anæsthetists who are engaged either in the teaching of anæsthetics at the schools of medicine and hospitals recognised by the University of Cambridge or in research in Great

Britain and Ireland. Membership is limited to 150. At the inaugural meeting, by resolutions which were unanimous, 95 members were elected, rules were passed, and a council of 16 members was formed as follows :—

President.—H. W. Featherstone (Birmingham).
Vice-President.—Joseph Blomfield (St. George's).
Hon. Secretary.—W. Howard Jones (Charing Cross).
Hon. Treasurer.—Z. Mennell (St. Thomas's).
Other Members of Council.—R. E. Apperley (Middlesex), H. E. G. Boyle (St. Bart.'s), J. H. Chaldecott (St. Mary's), Ashley S. Daly (London Hospital), H. P. Fairlie (Glasgow), A. L. Flemming (Bristol), C. F. Hadfield (St. Bart.'s), E. Falkner Hill (Manchester), Cecil Hughes (King's College Hospital), J. Ross Mackenzie (Aberdeen), G. Ramsay Phillips (St. Mary's), H. Torrance Thompson (Edinburgh).

Anæsthetists who desire to apply for membership should communicate with Dr. W. Howard Jones at 43, Cambridge-street, London, W. 2.

I am, Sir, yours faithfully,

HENRY W. FEATHERSTONE.

Birmingham, August 15th, 1932.

PROPHYLACTIC PLASMOQUINE ON A TEA ESTATE

To the Editor of THE LANCET

SIR,—Absence in Africa prevented me until last week from seeing Colonel Clemesha's letter in your issue of April 2nd, 1932 (p. 750), which purports to reply to my letter of Dec. 26th, 1931. In his letter Colonel Clemesha says that I was very reticent "about any recommendations I had made in Travancore," but remarked that on one or two estates I recommended extending the area to be oiled.

The facts are quite otherwise. Major H. Lockwood Stevens and I spent the best part of a week with Colonel Clemesha in Ceylon. We lived in the same hotels, and travelled with him all day. During that period we discussed fully, frankly, and critically the conditions, not only of the Travancore estates, but of other estates in Southern India with which he had been connected. The details of my findings on the estates, including the unsatisfactory condition of the oiling, and my recommendations were fully communicated to Colonel Clemesha, in the presence of Major Stevens, who had taken an active part with me in investigating the larval conditions on the Travancore and other estates. It was because of this full discussion that later, when Colonel Clemesha wrote asking for a copy of any recommendations I had made, it seemed unnecessary to write more than that my only recommendation was that "a definite area of a quarter of a mile round the lines should be selected and controlled on each estate." That was my only recommendation because it was, in my opinion, the only one required to make estates at that elevation healthy. It was abundantly evident during my visit that the necessity for definite oiling areas for these estates had never been clearly visualised by Colonel Clemesha, and this was borne out by the fact that the lines on two estates, which were injuriously affected by land not belonging to the Company, had not been protected by oiling, and that the oiling of important breeding places on other estates of the Company had been entirely overlooked.

That the oiling had been unsatisfactory cannot be disputed, and, as I said in my previous letter, this fact had been reported to the directors by Mr. Cantlay, who was in charge of the estates at the time of my visit. As Colonel Clemesha was told all this, your readers can judge for themselves how far the charge of reticence is true. And, after all, what earthly reason could I have had for being reticent? Since then the full quarter mile areas have been oiled, I am assured by Mr. Cantlay, with whom I discussed this subject before I wrote my letter of December last, and it was because of that discussion that I decided to challenge the correctness of Colonel Clemesha's statement that "all the natural conditions in the two years were identical," and his other statement that the "anti-larval measures had been carried out with equal vigour during the two periods" under comparison. Colonel Clemesha's whole case of anti-larval failure, and the success of plasmoquine turns on this point, and I think I have made it clear that his statements are essentially inaccurate. As for his statement that I did not consider the increase of the oiling areas of very great importance, that is in flat contradiction to all I have written during the past 30 years.

I might close my letter here, but some of your readers may desire me to reply to some of the other observations made by Colonel Clemesha. Of oiling areas he says he does not propose to say much; and he does not. In fact he does not give any indication of the area to be controlled. He merely says that for "mountainous countries such as the Vandiperiyar Valley" my "arrangements," whatever that means, are "useless." If he is referring to the area where oiling is to be done, surely the area must not be left to the inclination of the coolie. That would hardly conduce to efficiency or economy; and it certainly would reduce a scientific experiment to a farce. Colonel Clemesha cannot get away from this vital point by making vague statements about elementary knowledge of the habits of mosquitoes, &c., &c., and about "arrangements" being "useless." If oiling is not to be "useless" and wasteful, it is essential to decide the exact area to be oiled. And this question had not been answered by Colonel Clemesha for these estates before I saw him, and apparently he is not prepared to answer it now. If, on the other hand, "arrangements" means that the oiling itself is useless, why does he not recommend the estates to stop it? I know the answer he would get from the estates, because I discussed the point with Mr. Cantlay, who told me that under no circumstances would they stop the oiling, and that if there was to be a choice between plasmoquine treatment and oiling, it would certainly not be the oiling that would be stopped.

With regard to his question why in 1926 "in spite of the most careful oiling practically the whole of the labour force on estates in Malaya was seriously infected throughout the whole Peninsula," and why there was "a complete breakdown in his oiling measures," the answer is very simple. There was a sharp epidemic of malaria in the Peninsula which caught a number of people napping, and the question of the size of the area to be oiled was discussed. But there was no complete breakdown or even partial breakdown where oiling was properly carried out. I was in Malaya at that time and had an unusually wide knowledge of the country, for my consulting work took me from end to end of the Peninsula, and even into the Dutch Indies. I investigated this very point on a number of estates where failure of the half-mile radius was alleged to have occurred. In every case there was no difficulty in discovering breeding-places that had been overlooked and left unoiled within the areas that were supposed to be under perfect control. Further, those estates which had in fact maintained the efficiency of their oiling came through

this epidemic unscathed, and some estates which had recently initiated oiling showed remarkable improvements in health during this severe and testing epidemic year. And the statement that the "whole labour force on estates in Malaya was seriously infected throughout the whole Peninsula," is contradicted by the report of the Malaria Advisory Board, F.M.S., for the year 1926.

That there has been no "complete breakdown" in oiling, or that it is a discredited measure, in Malaya is borne out by the report of the Malaria Advisory Board of the F.M.S. for the year 1930, which states (par. 10) that the chief health officer issued, through the Planters' Association of Malaya, the following notice:—

"The Malaria Advisory Board invites the attention of all estate managers to the vital importance of maintaining anti-malarial oiling, draining, ditching, and filling, &c., on their estates during this time of economic stress. Loss of labour from sickness and death will inevitably result on estates where anti-malarial works are neglected. The Board also desires to draw attention to the fact that labour lines which may be closed down owing to the present depressed state of the rubber industry should not be reopened until anti-malarial measures on the estates have been carried out very thoroughly for at least three weeks prior to the date when new labour is to be engaged."

The year 1926 conclusively proved that for *A. maculatus* in Malaya the half-mile radius is sufficient. We already knew it was enough for *A. umbrosus* and *A. ludlowi*. And it is the officially accepted area to-day throughout Malaya, as may be seen in the section of the Straits Settlements annual report for 1930 (p. 15), dealing with the rural area of Singapore Island. Further, in spite of Colonel Clemesha's claim that where in India "*A. culicifacies* is the main carrier, we cannot lay down any such distance," there are reasons to believe that the same distance is sufficient. As long ago as 1902 the seventh report of the Malaria Commissioners of the Royal Society states that "where breeding-grounds are half a mile distant and have not recently existed closer, malaria is reduced to a minimum, and anopheles are not to be found in the houses." Since then many other observations have been made in India to confirm these conclusions which were based on extensive and accurate researches detailed in the Commissioners' reports. Colonel Clemesha evidently confuses the distance mosquitoes can fly from their breeding-places with the much shorter distance they can keep up endemic malaria, a distinction of vital importance in the practice of anti-malarial work.

In spite of his "considerable mathematical education" he thinks that it is necessary to "do away with 100 per cent. of anopheles" if the spread of malaria is to be stopped in an area. He says this is "impossible of realisation." Therefore, he argues, you must employ some other measure, for if you do not the results will be "much too slow for the commercial world." This is incorrect. Sir Ronald Ross, the late Prof. Carl Pearson, and others, showed mathematically that it is not necessary to get rid of 100 per cent. of anopheles in order to get rid of malaria. And the work in the Malay Peninsula and elsewhere has proved this practically. The work in Malaya was done in a country described by the High Commissioner (in an address to the Federal Council, F.M.S., on Nov. 16th, 1927) as "by far the most malarious country" which he has been in during his long and wide administrative career in the West Indies, West Africa, Ceylon, and Malaya. He said the development of the country "would have been totally impossible unless the danger of malarial infection had first been successfully combated." And he added that the "record of the American engineers and physicians at Panama sinks, in my judgment, into complete insignificance when compared with the practical achievements which have been effected during the last decade and a half in the Malay Peninsula." Surely, not an inconsiderable achievement for a people who knew not the term "anti-gamete campaign," evidently not "much too slow for the economic world," and a conclusive answer to Colonel Clemesha's "pure mathematics."

I am, Sir, yours faithfully,

MALCOLM WATSON.

The Ross Institute, Putney Heath, London, S.W., August 15th, 1932.

PYREXIA IN GENERAL PARALYSIS OF THE INSANE

To the Editor of THE LANCET

SIR,—In the leading article in your issue of August 20th we were quoted as saying that we regarded sulphur therapy in the psychosis as being largely, if not entirely, psychological in its effects. In case of possible misunderstanding we would like to state that when putting forward this hypothesis (THE LANCET, July 30th, p. 237) we were confining our remarks strictly to the psychoses under discussion—namely, schizophrenia and manic-depressive psychosis. The effect of sulphur therapy is entirely different in general paresis, for here we are dealing with an organismal disease, and there seems to be no room for doubt that in this particular psychosis the sulphur therapy, like other pyrexial treatments, brings about its results by its action on the spirochætes and the pathological changes which have resulted therefrom. That this appeared evident is our excuse for not having stated it explicitly in our paper.

We are, Sir, yours faithfully,

P. K. MCCOWAN,
M. L. M. NORTHCOTE.

Cardiff City Mental Hospital, August 22nd, 1932.

THE NATURAL ENEMIES OF THE BED-BUG

To the Editor of THE LANCET

SIR,—The note in THE LANCET for August 13th (p. 376) draws attention to a public health problem which has not yet, I believe, been satisfactorily solved—viz., the best way to combat the bed-bug pest. I have recently been studying this subject, and I have been surprised at our lack of practical knowledge (I speak for myself at any rate) on this important matter. Incidentally, I can testify to the value of the pamphlet, referred to in your note, by Major E. E. Austen; but the complete lack of uniformity in the practice of different health departments as regards disinfestation is an indication, I think, that we do not yet know what is really the best method of disinfesting bug-infested houses.

The question what are the "natural" enemies of the bed-bug is a very interesting aspect, but at present it cannot be said to hold out much hope of practical help. Few people, I fancy, would welcome the introduction of cockroaches, red-ants, or even of book-scorpions into their houses on the chance that they would wage war on bugs. My object in writing to you is to ask any of your readers who believe that they know the "best" method—i.e., from the point of view of efficiency and practicability—of disinfesting old cottage property which is bug-infested to let us know their experience.

I am, Sir, yours faithfully,

C. KILLICK MILLARD,
Medical Officer of Health, Leicester.

Health Department, Leicester, August 18th, 1932.

PYRETIC TREATMENT IN CASES WITH HYPOPIESIS

To the Editor of THE LANCET

SIR,—The importance of pyretic baths is becoming increasingly recognised, but there are difficulties in the way of their use in rheumatoid arthritis and other conditions in which the cutaneous blood-supply is deficient and where the blood pressure is too low. A further reduction of blood pressure, such as is produced by most baths, is obviously undesirable in these cases. The method to be described was suggested by the work of C. A. Neyman [1] in America, and appears to be one which produces a definite rise of blood pressure in hypopietic subjects accompanied by marked cutaneous hyperæmia, sweating, and sense of well-being. It can readily be modified as regards the temperature, and permits of very prolonged treatment.

Diathermy is combined with use of a thermega blanket, made by Thermega Ltd., London. The blanket, heated to medium strength, is covered with a towel or sheet on which the patient lies. Both soles are connected to one pole of the diathermy machine and both hands to the other. The patient is covered with the towel or sheet, and a blanket is placed over him and tucked carefully all round. Then a rubber sheet is placed over him, and then two or three more blankets. The hands are outside the rubber sheet. The diathermy current is gradually turned on until comfortably hot, the usual current being 0·6–1·2 amperes, according to the tolerance of the patient. After five or ten minutes the blanket is turned on to full strength. It is sometimes advisable to put some towelling over the blanket under the spine, since some patients appear to be unduly sensitive to heat in this region. During treatment either current can be varied at will or turned off altogether.

When the required temperature has been reached the diathermy current is cut off, and the patient is left to rest for a variable period with the mattress alone heated. During this time the temperature remains stationary or even rises. He then gets up and has a tepid bath or douche followed, if advisable, by massage.

This method appears to produce a rise of 1° F. in from 15 to 20 minutes, both in the mouth and rectum, and at the end of the treatment the rectal temperature usually remains higher than the oral one.

In this respect it differs from treatment with wax or thermega blanket alone, where the two temperatures seem to approximate. The difference may possibly be explained by the fact that much of the heat is derived from diathermy which probably produces internal as well as surface heat. Wax or the thermega blanket produce heat via the surface only. Mouth temperatures seem to have a close relationship to skin temperatures and skin efficiency, and are usually 1 to 3° F. lower than those in the rectum. Hence, skin inefficiency may be the cause of the frequency of low oral temperatures.

Sweating appears after 99° F., or thereabouts, and becomes very profuse. Quite high temperatures can be tolerated without the pulse frequency rising out of proportion to the temperature, but when this occurs it is an indication to cease, or reduce strength of currents. The length of treatment is determined by the sensations of the patients, the pulse frequency, and the actual degree of pyrexia. It varies from 15 to 60 minutes, since each patient seems to exhibit a different tolerance. The blood-pressure readings show, in some cases, a very considerable systolic rise after treatment, 10 to 15 mm. of mercury, and there is an equivalent rise in the diastolic pressure. This rise seems to be maintained for days at a time. The hypopietic patients feel better, and do well with this method even when all others have made them depressed.

Control experiments with 4-pole diathermy alone failed to show a similar rise in blood pressure, and gave a much slower rise in temperature. The thermega mattress alone gave a very slow rise in temperature—1° F. in 45 minutes—and no alteration in blood pressure in the same time.

It has been suggested that radiant heat should be used as an accessory in such pyretic treatments, but this has not been employed because a plain radiant heat bath has been found to produce a rise in pulse-rate out of all proportion to the temperature.

For obvious reasons no work has been done on hyperpietic cases.

The treatment prescribed can be used for a very ill patient, since the apparatus is portable. No very high temperature could then be obtained, however, since a less powerful diathermy machine would have to be used.

I am, Sir, yours faithfully,

August 27th, 1932. H. W. HALES, M.D. Camb.

[1] Brit. Jour. Physical Med., 1931, vi., 141.

THE ANÆMIAS OF PREGNANCY

To the Editor of THE LANCET

SIR,—The leading article in your issue of August 20th contains valuable suggestions for future experimental and clinical work on this subject. But the same article tends to obscure, and therefore to cause neglect of, an important point in practical treatment. Stress is laid on the possible link between the anæmias of pregnancy and the nutritional or dietetic anæmias. The inference from this is that anæmias of pregnancy will inevitably respond to nutritional measures—liver, iron, or vitamins. Actually this is not the case. Present-day clinical experience has shown that blood transfusion, sometimes repeated, is in certain cases the only effective treatment, and that transfusion has given dramatic results where the exhibition of liver and other nutritional measures have failed. Whether this clinical fact places some of the severe anæmias of pregnancy in a separate category from anæmias of alimentary origin is as yet unknown, but it is worthy of consideration. At the present time it would appear dangerous to give the profession the impression that nutritional measures are an infallible cure for all the anæmias of pregnancy.

I am, Sir, yours faithfully,

LIONEL E. H. WHITBY.

Middlesex Hospital, W., August 30th, 1932.

THE BIOLOGY OF TUMOUR FORMATION

To the Editor of THE LANCET

SIR,—Many years ago the well-known botanist, Sir John Farmer, and certain co-workers tried to find definite cytological evidence pointing to a change towards sexual character in a cancerous cell to be deduced from the state of the chromosomes. All efforts to obtain verification of such a condition however failed; regular and persistent transverse (reducing) divisions do not occur, and the chromosomes of malignant cells are not in the haploid state. In your issue of August 20th (p. 421) Dr. M. F. Sorour has revived this subject. Admittedly there is abnormal and irregular mitosis—and, incidentally, a fair amount of amitotic division—in cancerous cells; but it is a far cry from this to the remarkable and specific reducing division of a sex-cell, which is a unique and specialised adaptation to the essential purpose of such a cell—namely, conjugation. In the development of the metazoan body, the gonadic tissue is, from the first, kept quite apart and the cells of which it is composed are the only ones which possess all the qualities and are the complete homologues of the unicellular type of animal. On a priori

grounds, therefore, it is, biologically, highly improbable that the one essential character which the gonad cells alone have retained, the capacity for sexual union, should crop up in any somatic cell. Such a view is another instance of the old confusion regarding "sexual reproduction," which Minchin clearly explained in his book on the Protozoa. Sexual union and multiplication (reproduction) are two quite distinct functions—not necessarily related at all. I would remind Dr. Sorour of the following points. In a developing mammary gland, during pregnancy, there is, for instance, just as active and at times irregular multiplication of the glandular epithelium, with the same "passing inwards" of the cells, as can be seen in many a malignant growth. Again, in the case of an epithelioma, which is *not*, in the great majority of cases, in a "germinal" layer, the cancerous cells are multiplying and pushing inwards long before they are free and have any opportunity to "conjugate"—supposing they had the power to do so. The great change has taken place: there is no need of any conjugation process to stimulate them to multiply and wander.

I am, Sir, yours faithfully,

H. M. WOODCOCK.

Walton-on-Thames, August 28th, 1932.

PUBLIC HEALTH SERVICES

A Year's Work in a Scottish Tuberculosis Colony

THE report for 1931 of Hairmyres Colony for the tuberculous in the County of Lanark is something more than a record. Whatever demerits there may be in the word "colony" as applied to the treatment of tuberculosis, it serves the useful purpose of making classification more simple, for tuberculous institutions can be divided, widely speaking, into two large groups: (*a*) those which conduct sanatorium treatment in accordance with time-honoured principles and which do not specialise in any way in occupational therapy and settlement for patients; (*b*) those which have attached to the sanatorium proper an industrial organisation, as at Papworth in Cambridgeshire, Preston Hall in Kent, Barrowmore Hall in Cheshire, and Hairmyres Colony in Lanark. At Hairmyres on Dec. 31st last, 216 patients were in residence—men, women, boys, and girls are admitted. The report gives an account of the use of X rays and lipiodol in treatment, and it is instructive to note the extent to which actinotherapy was used. For artificial pneumothorax 158 injections (including inductions) were given, and the sanatorium is fortunate in having the services of Mr. Donald Duff to perform such chest surgery as is considered necessary, although, in the absence of a fully equipped operating theatre, the operations have been limited to phrenic avulsion. Blood sedimentation reactions are part of the routine clinical examination of each adult on admission, and Dr. J. Johnstone, the physician-superintendent in charge, is of the opinion that the test is useful in forming an opinion on prognosis. Patients with a positive sputum have a higher sedimentation rate than those with a negative sputum, and the more advanced the disease the higher the rate. The account of blood pressure examinations, and of fractional test-meals after the method of Ryle, show that the high standard of medical work of previous years has been maintained. For the occupational therapy experienced instructors are employed; the working hours vary from two to six, according to the patient's physical condition. The special departments are: gardening, forest nursery, poultry, pigs, and general farm work. Industrial workshops—motor department, cabinet making, boot-repairing, basket-making—enable patients to regain normal working capacity in the final stages of treatment. In Dr. Johnstone's view the local authority should not lose sight of a trainee on completion of his training, but be prepared to give a helping hand where necessary. Hairmyres is, in fact, probably the best example of a training colony to be found in the country to-day. The further step towards the establishment of a village settlement, for which the institution at Hairmyres would be an ideal centre, has not apparently been entertained.

PORT SANITARY AUTHORITIES

Port of Liverpool

Dr. W. M. Frazer, port medical officer of health, in his first annual report for 1931 to the Liverpool Port Sanitary Authority, mentions that 7279 ships arrived from abroad, and 7651 coastwise, and that 5137 were examined by sanitary inspectors and 866 by medical officers, a certain number apparently not being inspected. Of infectious diseases the most frequently met was tuberculosis (56 passengers and 21 sick seamen in crews). No case of plague, typhus, cholera, or yellow fever appeared, but three cases of cerebro-spinal fever are mentioned, one in a passenger, one in a seaman during voyage, and one in a seaman who was landed at Liverpool; we are not told if the cases occurred in the same or different ships. Malaria (42 cases) and venereal diseases (171) are noticed as diseases which concern the health department, for if not treated thoroughly they may become chronic and cause long disability. Of anthrax 3 cases came to notice, but nothing is said of their fate. It is requested that suspicious cases shall be sent to Fazakerley Hospital at once (whether from within or without the area) for diagnosis, and for treatment if required. The Government's Wool Disinfecting Station continues to send samples of untreated and treated wools to the city bacteriologist as a control on its work. To prevent anthrax spores reaching imported cattle-foods, it is suggested that contaminated hides should be always stowed at the bottom of holds. Rats are far fewer than they were. In the report for 1925 over 61,000 rats were claimed as destroyed, in 1931 only 30,412. In 1925 each vessel fumigated averaged 40 rats, but in 1931 only 2·02, and an individual ship that had 650 rats on fumigation in 1925 showed but 22 in 1930. The fall, which has been continuous, is ascribed in the first place to rat-proofing afloat and ashore, but largely to Article 28 of the 1926 International Sanitary Convention, which directs that a ship must be fumigated every six months, unless the rat population is kept down to the minimum. This in Liverpool is held to mean there are no traces of rats on the ship, and rats cannot keep themselves very secret, for a rat leaves some 50 droppings about every 24 hours, and the port has some dozen searchers on the watch. Over 3000 rats were examined for plague, but none was found infected. 1835 early venereal cases (men 1598, women 237) were seen at the six Liverpool treatment centres. They were, per 100, thus distributed: syphilis, men 10·7, women 1·1; soft chancre, men 5·4, women less than 1; gonorrhœa, men 71, women 11·7 (from the Table facing p. 44).

Accommodation for seamen is being improved; nuisances on ships are readily remedied; verminous infestation has markedly decreased, as happens if the quarters are fumigated every voyage and sprayed with an insecticide. The chief nuisances are dirty forecastles (2016 are reported) and 278 foul water-closets in 719 of 5137 ships. Thus there were 4418 ships with no defect. A very important part of the work of the authority is the supervision of foodstuffs. Epizoötic lymphangitis in mutton was found in over 2 per cent. of consignments from Argentina, Uruguay,

and Patagonia. Inspection in the Irish Free State is quite satisfactory, but not so reliable in North Ireland. *Onchocerca gibsoni* was found in certificated beef from Australia. Sterilised tongues (of probably tuberculous cattle) from North America are refused entry and re-exported. Fruit has at times to be repacked after sorting. Nearly 3000 tons of foodstuffs were "utilised under supervision" for the production of manures, &c., and kept out of the market, showing how valuable to the country is the work of the Port Sanitary Authority.

Tyne

Dr. W. E. Harker says that in 1931 3977 ships arrived from abroad—of these 3769 (94 per cent.) were inspected by sanitary inspectors, 524 (13 per cent.) by the medical officer; and 14,605 arrived coastwise—of these 4025 (27 per cent.) were examined by inspectors, 16 (1 per cent.) by the medical officer. Ninety per cent. of the tonnage visiting the port was examined for the presence of nuisances; in 888 ships 248 required the refitting of side scuttles, 419 forecastles wanted cleaning and painting, 65 forecastles were verminous, water-closets were defective in 44. Discarded beds to a total of 1183 were ordered to be destroyed; these were probably of the type known as "donkey's breakfast," and left behind by sailors when leaving the ships. Most of the passengers being Scandinavian are of a healthy cleanly type. The chief imports are timber, the chief export, coal. Ships are supplied with water from public water-supplies, either from hydrants or by water boats; of these last there were 16, periodically inspected. Infectious disease: 8 cases were landed and sent to Walkergate Hospital, no case of cholera, plague, or small-pox came to notice. Reports of venereal disease are called for, but no mention is made of the number seen. Of rats, 2750 black and 2495 brown were destroyed on vessels; the high proportion of brown (*R. norvegicus*) is noteworthy. Six and a half tons of fish and eight tons of potatoes were condemned; the fish was sent to manure works; 13 fishing boats were cleansed and deodorised.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 20TH, 1932

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 17 (last week 16); scarlet fever, 1025; diphtheria, 633; enteric fever, 57; acute pneumonia (primary or influenzal), 371; puerperal fever, 30; puerperal pyrexia, 108; cerebro-spinal fever, 22; acute poliomyelitis, 8; acute polio-encephalitis, 1; encephalitis lethargica, 5; dysentery, 15; ophthalmia neonatorum, 79. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 23rd–24th was as follows:—Small-pox, 21 under treatment, 3 under observation (last week 32 and 3 respectively); scarlet fever, 1075; diphtheria, 1246; enteric fever, 13; measles, 511; whooping-cough, 439; puerperal fever, 25 (plus 9 babies); encephalitis lethargica, 229; poliomyelitis, 3; "other diseases," 104. At St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 12 (3) from measles, 5 (4) from scarlet fever, 23 (5) from whooping-cough, 18 (5) from diphtheria, 45 (13) from diarrhœa and enteritis under two years, and 17 (1) from influenza. The figures in parentheses are those for London itself.

There is as yet no rise in the number of deaths from diarrhœa. The fatal cases of typhoid or paratyphoid occurred at Southgate, Sunderland, and Wolverhampton. Seven of the deaths from measles were reported from Liverpool. Whooping-cough claimed 2 victims each at Hull, Leeds, and Middlesbrough. Diphtheria accounted for 3 deaths at Hull, 2 each at Edmonton and Warrington. Three children died from diarrhœa at Liverpool, 2 each at Bootle, Leeds, Newcastle-on-Tyne, Bristol, Leicester, and Cardiff.

The number of stillbirths notified during the week was 235 (corresponding to a rate of 36 per 1000 total births), including 32 in London.

OBITUARY

GUSTAVE MONOD, M.D. Paris, F.R.C.P. Lond.

Dr. Monod, whose death last month at Vichy was briefly recorded, was born in Paris in 1878, the son of a pastor of the Waldensian Church. He was educated at the Lycée Henri IV. and at the University of Paris, becoming in due course an externe and serving a while as interne at the Asiles de la Seine. He also rose to the rank of major in the military Service de Santé. He settled at Vichy, where his life was spent in the application of spa methods to medical practice, particularly in the treatment of gastro-hepatic disorders. He was, as Sir James Barr writes, specially interested in the physical side of therapy. "We can foresee," he said, "a new class of drugs acting merely by virtue of their physical properties"—a thesis which he developed in a lecture delivered two years ago before the Hunterian Society of London. This address was based not only on an abundant clinical experience of mineral waters, but on an experimental study of their immunising properties. Monod had the sense not to use physical treatment by rule of thumb; he recognised in mineral water a two-edged weapon capable of doing both harm and good, but he retained his belief in the anti-anaphylactic effect of waters on most chronic affections, and there is no doubt that multitudes of patients benefited at his hands. His intimate knowledge of spa treatment in this country and the fact that he was strictly bilingual made him a happy influence in Anglo-British medical relations. It was he who arranged in the spring of 1928 the programme for the study tour of the Royal Institute of Public Health to Paris hospitals and some of the French spas.

Dr. Fortescue Fox writes: "Monod was one of the original members of the International Society of Medical Hydrology. He was made representative for France in 1921, and held the office of president with much distinction during two rather difficult years. His contribution to modern hydrology was a practical one. Following two other brilliant Frenchmen, Fleig and Billard, who also both died in middle life, it was Monod's achievement to put the work of these pioneers to the test of patient clinical study. By his search for and belief in guiding principles, his calm philosophic outlook, his understanding and urbanity and charm he was one of the great spa physicians of our time."

Last year Dr. Monod was elected F.R.C.P. Lond.; he had long been Chevalier of the Légion d'Honneur. His house in the Rue Alquié at Vichy was a centre of hospitality and medical reciprocity, and a large circle of friends will regret his early death, which was due to angina pectoris. He leaves a widow and two daughters.

Dr. GEORGE KENDALL, who died at Eastbourne on August 19th, was the son of Mr. Charles Fisher Kendall, of Clapham. Born in 1856, he was educated at University College School and Guy's Hospital. On qualifying, in 1883, he practised for a short time in Yorkshire, but then he came south and settled at Battle, where he remained in practice for 44 years. During the late war, although advancing in years, and with the strain of a large district which he worked alone, he worked as medical officer at Lady Brassey's Hospital at Normanhurst. Dr. Kendall is survived by a widow and two daughters.

MEDICAL NEWS

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—E. F. Baines, Universities of Cambridge and Leeds; V. Constad, Guy's Hosp.; G. E. Ellison, Univ. of Cambridge and Royal Colleges, Edinburgh; J. O. Gordon, and K. M. Hahn, Middlesex Hosp.; M. S. Mules, Royal Free Hosp.; T. D. Norton, Univ. of Sheffield; C. V. P. Pillai, London Hosp.; W. S. Pitt Payne, Guy's Hosp.; S. Pugmire, Univ. of Liverpool; S. H. Tan, Univ. of Birmingham; E. Teplitzky, Univ. of Berne and St. Mary's Hosp.; and J. C. Williams, St. Mary's Hosp.

Medicine.—E. F. Baines, Universities of Cambridge and Leeds; G. S. Grist, Univ. of Oxford and St. Mary's Hosp.; M. N. Mandelstam, Middlesex Hosp.; F. C. Moll, Westminster Hosp.; W. S. Pitt Payne, Guy's Hosp.; A. E. A. Ridgway, Charing Cross Hosp.; C. A. Saggoo, King's College Hosp.; and S. H. Tan, Univ. of Birmingham.

Forensic Medicine.—E. F. Baines, Universities of Cambridge and Leeds; J. L. Bates, Guy's Hosp.; J. Harris, Univ. of Witwatersrand and Middlesex Hosp.; G. F. C. Harvey, Univ. of Manchester; R. P. Huggins, Westminster Hosp.; G. McArd, Royal Free Hosp.; J. W. Meyers, King's Coll. Hosp.; W. Nicholls, Guy's Hosp.; A. E. A. Ridgway, Charing Cross Hosp.; B. Shapiro, Univ. of Witwatersrand and St. Mary's Hosp.; and S. H. Tan, Univ. of Birmingham.

Midwifery.—E. F. Baines, Universities of Cambridge and Leeds; J. Harris, Univ. of Witwatersrand and Middlesex Hosp.; H. A. Kamel, Univ. of Manchester; M. F. Levick, Univ. of Sheffield; T. E. Mitchell, Guy's Hosp.; J. E. Morrish, St. Mary's Hosp.; C. V. P. Pillai, London Hosp.; S. Pugmire, Univ. of Liverpool; and A. E. A. Ridgway, Charing Cross Hosp.

The following candidates, having completed the final examination, are granted the diploma of the Society, entitling them to practise medicine, surgery, and midwifery: E. F. Baines, F. C. Moll, M. S. Mules, T. D. Norton, C. V. P. Pillai, W. S. Pitt Payne, and B. Shapiro.

Empire Dental Convention

A joint meeting of the British, Canadian, and Ontario Associations was held at Toronto, August 8th to 12th, in accordance with the scheme of Empire dental affiliation first drawn up at the jubilee meeting of the British Dental Association in London in 1930. The British dentists, who were joined by a representative from Australia (Dr. Arnott) and by many American colleagues, received a hearty welcome. An address was given by Mr. W. J. Stewart, mayor of Toronto, and messages were received from the Prime Minister of Ontario and Sir Norman Bennett. At the scientific sessions a wide field was covered, but the prevention of dental disease was in the foreground. The arrangements included a public dental health luncheon, at which there were speeches on Social Dentistry, and a visit was paid to the station to inspect a dental car, equipped and presented by the Canadian Pacific Railway. This car, which accommodates a dentist, his wife, and a nurse, is fitted out with a waiting-room, surgery, and kitchen; water and electricity are supplied. It is taken to the end of a railway line in remote parts of the country and remains there for a month or more, while the children from the surrounding districts are brought for treatment.

The central feature of the meeting was the reception at Toronto University by the chancellor, Sir William Mulock, when the president of the British Dental Association, Mr. George Northcroft, received the LL.D. (honoris causa), together with Dr. C. N. Johnson and Dr. A. E. Webster. Members of the party were also entertained at Ottawa, Montreal, and Quebec.

American Congress of Physical Therapy

The eleventh annual session of this congress will be held in New York City from Sept. 6th to 9th, under the presidency of Dr. F. H. Ewerhardt (St. Louis). The foreign guest of honour will be Dr. F. Howard Humphris (London), and after the induction of the president-elect he will deliver an address on the Treatment of Health by Light. At a joint meeting of all sections he will also speak on the Medical Use of Radium in Minimal Doses. Among the many subjects of discussion at the congress will be electro-surgical methods in urology, electrocardiography, electrocoagulation of the tonsils, fever therapy, arthritis, and disorders of the colon.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.1.

MONDAY, Sept. 5th, to SATURDAY, Sept. 10th.—BROMPTON HOSPITAL. Diseases of the Chest, Sept. 5th to 10th, all day.—BETHLEM ROYAL HOSPITAL. Psychological Medicine. Sept. 6th to 30th. TUESDAYS and FRIDAYS at 11 A.M.

Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £100.

All Saints' Hospital, Austral-street, West-square, S.W.—Res. H.S. At rate of £100–£150.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.

Bath, Royal United Hospital.—H.P. At rate of £175.

Birkenhead General Hospital.—Cas. O. At rate of £100.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Chelmsford and Essex Hospital.—Res. M.O. £150.

Chester Royal Infirmary.—H.S. to Ear, Nose and Throat Dept. £150.

Chichester, Graylingwell Mental Hospital.—Third Asst. M.O. £350.

Children's Hospital, Hampstead, College-crescent, Swiss Cottage, N.W.—Res. M.O. At rate of £100.

Colchester, Essex County Hospital.—Asst. H.S. £120.

Coventry and Warwickshire Hospital.—Two Res. H.S.'s. Each £125.

Derby, Derbyshire C.C.—M.O. £600.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150. Also H.S. to Spec. Depts. and Cas. O. Each at rate of £120.

East London Hospital for Children &c., Shadwell, E.—Cas. O. £125.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Hon. Clin. Assts.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100.

Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.

Leicester Royal Infirmary.—Two House Surgeoncies. Each £125. Also H.P. At rate of £125.

London Homœopathic Hospital, Gt. Ormond-street and Queen-square, W.C.—Res. M.O. £100.

London Lock Hospital, 283, Harrow-road, W.—Res. M.O. At rate of £175.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester, Royal Children's Hospital.—Asst. M.O. for Out-patients' Dept. At rate of £150.

Miller General Hospital, Greenwich-road, S.E.—Hon. Surgeon to the Nose, Throat and Ear Dept. Also H.P. £100.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. and Out-patient Officer. At rate of £150 and £125 respectively.

National Hospital, Queen-square, W.C.—Hon. Dental Surgeon.

Northampton General Hospital.—H.S.'s. Each at rate of £150.

Norwich, Norfolk and Norwich Hospital.—Hon. Asst. Surg.

Nottingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Nottingham General Hospital.—H.P. At rate of £150.

Portsmouth, Royal Hospital.—Sen. H.S. At rate of £175. Also H.P., Two H.S.'s and Cas. O. At rate of £130 and £100 respectively.

Preston and County of Lancaster Royal Infirmary.—H.S. to Special Depts. At rate of £150.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £75.

Queen Mary's Hospital for the East End, E.—Hon. Asst. S. for Ear, Nose, and Throat Dept. Also Dental Anæsthetist. £25.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. H.S. At rate of £150.

Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.

St. Helens County Borough.—Asst. M.O.H. £500.

St. Leonards-on-Sea, Buchanan Hospital.—Sen. and Jun. H.S. At rate of £175 and £125 respectively.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Salford Royal Infirmary.—Two H.S's. to Special Depts. Each at rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £175.

Southend-on-Sea, New General Hospital.—Res. H.P., H.S. and Cas. O.

Taunton, Taunton and Somerset Hospital.—Sen. House M.O. and H.S. At rate of £150 and £100 respectively.

West London Hospital, Hammersmith-road, W.—H.P., Three H.S.'s, and Res. Anæsthetist. Each at rate of £100.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £150.

Wolverhampton Royal Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at South Shields (Durham); Maesteg (Glamorgan); Westbury-on-Trym (Gloucester); and Westminster (London).

Lieut.-Colonel Pinthu Sai, M.B. Lond., has been promoted to be director-general of medical services of the Ministry of National Defence of Siam. Colonel Sai, who qualified from St. Thomas's Hospital in 1914, was formerly assistant professor of surgery in the Siriraj Hospital Medical School, Bangkok.

NOTES, COMMENTS, AND ABSTRACTS

THE NIGHTMARE: MEDICAL, THEOLOGICAL, AND POPULAR VIEWS *

BY ERNEST JONES, M.D. LOND.
DIRECTOR OF THE LONDON CLINIC OF PSYCHO-ANALYSIS

USUALLY in reading a paper on the history of any medical topic one not only starts from a basis of modern knowledge and compares that with the past development of such knowledge, but one also safely assumes that one starts from the same basis of modern knowledge as that possessed by the audience. With the present topic, which concerns the pathogenesis of nightmare, I dare hardly assume that I am in that fortunate position. It is my firm conviction that during the past thirty years valuable knowledge has been acquired which places the pathology of nightmare on a quite different footing from that which it previously occupied. But as yet this knowledge is confined to a very small section of the medical profession. If a lecturer were to contrast our present knowledge of the pathogenesis of, let us say, malaria or pulmonary tuberculosis, with the views on these conditions current in the Middle Ages, he might find the latter interesting, he would probably find them quaint, and he would certainly be aware of a sense of immense distance separating the two worlds of knowledge. He could trace the gradual development of the knowledge we now possess from its crude beginnings, but suppose he were to expound this development before a mediæval audience of physicians! His task would be one of extraordinary difficulty. Physical medicine has made vast strides in the past centuries and these achievements are widely distributed among the profession as a whole. With psychopathology, however, although correspondingly vast strides have been made, knowledge of them is narrowly confined to a small group of the profession. To a modern psychopathologist the views on his problems that are held and accepted by the main bulk of the medical profession are, like the mediæval views on malaria, sometimes interesting, often quaint, and always separated by a vast gulf from modern knowledge.†

Originally all pathology was a branch of psychopathology. That is to say, all views on the causation of disease, whether held by medicine men or their victims, were essentially of subjective origin. All disease was regarded as punishment for sinful impulses or as proceeding from inexplicably evil-minded spirits. It thus emanated from malignity, whether endogenic or exogenic, and the task of the healer was in some way to exorcise or expel the malignity. That the procedure adopted usually involved considerable discomfort, if not suffering, to the patient was due to the healer's intuition that the ultimate source of the malignity was probably endogenic. The development of scientific medicine really meant the demoralising of pathology, the substitution of physical causation for moral—i.e., malign—causation, and modern medicine laughs at the groundlessness of the primitive views. In so doing, however, it falls into the old mistake of emptying the baby with the bath. For all disease is not physical in nature, and there is one sphere in which there was an element of truth in the primitive view that the organism can be deranged by moral agents. I refer to the sphere of the mind, where the gravest mischief can be wrought by conflicts of a moral order, by turmoils where the passions of love, hate, guilt, and sin are the fundamental generators of disorder. Through rejecting the primitive and popular moral view of pathology, and through thus escaping from the web of subjectivity, scientific medicine has been able to make magnificent conquests and to prepare the way for yet greater ones. Fortified by its obvious success in concentrating on the physical, it has developed something like a phobia of everything mental by thoroughly confounding the mental with the subjective. In so doing it has in this respect abandoned the true path of science. Otherwise it would have with patience and curiosity regarded primitive pathology as being in itself a phenomenon necessarily having a cause and meaning which might be examined, and this would have opened the way to a much earlier understanding of mental disorder. Matters, however, had to follow the course they did, and it is only of quite recent years that some spirits have been venturesome enough to hark back to primitive pathology, to inquire what it was all about, and—while recognising its illusory projections on to the physical sphere—to examine whether the causes leading to those views have produced other results in their own mental sphere which are still to be recognised.

Few problems illustrate this thesis better than does the pathogenesis of the nightmare. The primitive view of the nightmare was that it represented an attack by a throttling demon. This belief was perhaps the most nearly universal belief about the spirit world that has ever been held, and it is generally thought, as was first enunciated by Hobbes,[1] to have exercised historically a profound influence on the genesis of all forms of belief in the supernatural. Originally it must of course have been held also by medicine men, until it was supplanted by the still current teaching that nightmares are the result of physical disorder. The first definite beginning of this latter teaching is to be found in the works of Galen,[2] who held that gastric disturbances produce nightmare, and who was subsequently supported in this view by Paulus Ægineta.[3] The somatic theory, however, was slow in gaining ground even among physicians, who did not generally accept it until well after the Renaissance; in the populace it displaced the previous spirit theory only in the eighteenth century.

Ætiology of the Nightmare

Before considering the somatic, or medical, theory, it will be well to define the phenomena of the nightmare. Its cardinal features are: (1) agonising dread, of an intensity probably unequalled elsewhere in life; (2) a sense of stifling and overpowering oppression at the chest, which may alarmingly interfere with respiration, and (3) a conviction of helpless paralysis affecting especially the speech and limbs. The oppression is often portrayed as a monster, an animal, or a brutal man. Accessory symptoms, resulting from the fear, are cold sweat, palpitation, and subsequent malaise and depression. Of the manifold medical explanations of the condition that have been offered, most invoke disorder of the gastric, circulatory, or respiratory systems. These explanations fall essentially into two groups. On the one hand various indigestible foods are thought to supply sources of irritation to the central nervous system, while on the other various mechanical sources of embarrassment to the circulation and respiration—principally a distended stomach and a constrained posture—are asserted to be the effective agents, an explanation sometimes amplified by the suggestion that non-aerated blood poisons the brain. It will be seen that indigestion can be regarded as operating in both these ways, which is doubtless a reason why it is the ætiology chiefly favoured.

I shall presently give reasons for thinking that these medical views are themselves of subjective origin and dictated by definite unconscious motives. Apart, however, from such considerations, any impartial investigator cannot fail to be struck by

* Read before the Section of the History of Medicine, Royal Society of Medicine, April 6th, 1932.

† The views discussed in the present paper are abstracted from a volume recently published by the author, entitled "On the Nightmare" (Hogarth Press, 1931), to which references may be made for further detail.

the singular lack of correlation between the alleged causes and the actual attacks. In other words, the most damaging criticism of all the hypotheses is the simple observation of the frequency with which on the one hand the alleged factors occur without being followed by nightmare, and with which on the other hand attacks of nightmare occur without having been preceded by any of the alleged factors. Two facts definitely stand out in any such inquiry. *First*, all the alleged causes of nightmare often occur, both alone and in combination, in persons who never show any symptom of nightmare; a patient whose stomach is half destroyed with cancer may commit all sorts of dietary indiscretions, including even indulgence in cucumber—the article of food that is most viewed askance in relation to nightmare—he may even sleep on his back, and still will defy medical orthodoxy in not suffering from any trace of nightmare. *Secondly*, a habitual sufferer from nightmare may be scrupulously rigorous in regard to both the quality and quantity of all that he eats, may in fact develop a *maladie de scrupule* in this direction, he may martyr himself with elaborate precautions to avoid these and other "causes" of the malady, and by means of a contrivance of spikes insure against ever lying—let alone sleeping—on his back, but despite all his endeavours he will have to endure as many and as severe attacks as before.

Looked at quite simply, the prominent manifestations of nightmare are seen to be an overmastering dread and terror of some external oppression against which all the forces of the mind appear vainly to be fighting. They are thus pre-eminently mental manifestations, the central one being a morbidly acute feeling of anxiety. We have therefore to inquire into the nature and origin of this emotion in general. It may at once be said that anxiety, when developed to anything approaching the extent present in nightmare, is altogether a pathological phenomenon, and in fact forms the cardinal feature of the well-defined malady known as the anxiety psycho-neurosis. Moreau [4] in 1845, was the first to cast doubt on the physical explanations of nightmare, but long before this, in the early seventeenth century, Burton [5] had given an excellent account of morbid anxiety states and definitely suggested that nightmares were simply manifestations of them.

Splittgerber [6] in 1866 remarked that terror dreams were probably the expression of a bad conscience, and already in the sixteenth century Thomas Nashe [7] had forcibly expressed the same opinion. He wrote: "When Night in her rustie dungeon hath imprisoned our ey-sight, and that we are shut seperatly in our chambers from resort, the divell keepeth his audit in our sin-guilty consciences, no sense but surrenders to our memorie a true bill of parcels of his detestable impietis . . . Therefore are the terrors of the night more than of the day, because the sinnes of the night surmount the sinnes of the day."

Now, as with the history of medical views on the pathology of nightmare, so also with those on the pathology of morbid anxiety (fear, dread, apprehension panic, &c.), we find a complicated groping in the dark so long as the explorers were tied to physical explanations. This is not the place to undertake a review of the mainfold hypotheses of this kind, a task I have attempted elsewhere.[8] Some of them, notably speculations about irritation of the pons, medulla, and other structures at the base of the brain, are still current. The mere fact, however, that, after all, fear is a mental phenomenon should have encouraged us to explore first the psychological avenue as the most direct one, and doubtless this would have been done earlier had it not been for the hindrance of materialistic dogmas, the proved sterility of which in the mental sphere in no way impaired the illusion of potency that so long invested them.

The Correlation between Fear and Sex

It was only the present generation, led by a few pioneers, that has had the enterprise to attack such problems directly, and among the first-fruits of these attempts was Freud's epoch-making discovery that the most intimate connexion exists between morbid fear on the one hand and repressed sexual impulses on the other. His investigations showed him that behind every morbid fear—e.g., phobia—lay an associated sexual wish that had been repressed from conciousness. As Freud [9] put it, in the place of a sexual wish which would have been manifest were it not for the repression, there appears in conciousness a morbid fear—i.e., a fear irrational in quality or quantity, or both. He took the view that the energy was the same in the two manifestations, that the sexuality had been actually converted into fear, and at first tried to explain this on a physical and chemical basis. More than twenty years ago I suggested,[8] as a more likely explanation, that the instinct of fear was stimulated as a defence against certain dangers imagined to attach to particular sexual wishes and situations, and of late Freud [10] has expressed himself also in favour of this view. The main point, however, is the connexion itself, the intimate dependence of morbid anxiety on repressed sexuality.

The evidence supporting this general conclusion is in my opinion convincing. Study of a series of nightmare manifestations has yielded the following results. To begin with, only a certain class of subject is apt to suffer from nightmare, which is the reason why experimental endeavours to evoke attacks of it are applicable only with recognised sufferers. Three features characterise the class in question. First, they are suffering—as other manifestations make evident—from pronounced psycho-sexual conflict, essentially unconcious in origin, and further, one can usually trace some incident just preceding any given attack which has especially stirred this conflict. Secondly, they possess a particular psycho-sexual constitution characterised by intense repression of strong, masochistic tendencies, which come to expression in the nightmare itself. Thirdly, the endopsychic conflict from which they suffer always relates to incest, this doubtless being the reason why the repression is so very intense. In a large number of the dreams culminating in the nightmare experience the sense of oppression is visualised as an animal or hideous monster attacking or actually weighing on the breast. Now an animal appearing in a dream not only represents some human being, as animals do in mythology, but it represents some member of the subject's own family, usually a parent. Incidentally, as was first pointed out by Guillaume de Paris [11] in 1230, there is little doubt that the whole mass of beliefs in the interchangeability of animal and human, with the complicated doctrines of metamorphosis and metempsychosis, derive much of their strength from dream experiences where the transformation often takes place directly before the eyes of the dreamer.

I cannot enter further here into the complex problems of symbolism and the other distorting mechanisms operative in the formation of dreams, since my present purpose is merely to contrast the modern psychopathological theory of nightmare with the medical and popular explanations of this phenomenon that have hitherto been current. I would, however, add that the psychopathological theory does not dismiss the physical explanations entirely, though it does relegate them to a subordinate position. They would seem to possess a certain limited validity. For instance, when a body of fear exists, of the origin noted above, certain physical stimuli can coöperate in arousing it. When a morbid fear of suffocation, for example, is present, it can be stirred not only by excitation of its specific sources in the unconscious mind, but also by an actual situation—e.g., an enclosed space, which may remind the subject of the dreaded idea. Similarly someone liable to nightmare is more apt to experience an attack if respiration is impeded—e.g., by an angina or even a common cold. A full stomach may perhaps act in more than one way. Apart from any possible mechanical effects, food and drink are well known often to have aphrodisiac associations; every *roué* acts on the principle of the old maxim: *sine Cerere et Baccho friget Venus*.[12]

It is impossible to discuss adequately the history of the pathology of nightmare without at the same time taking into consideration the phenomena of ordinary erotic dreams as well. In the first place—and this is highly significant—the two classes of dream are sharply distinguishable from each other only in their extreme forms. On the one hand, for more than a thousand years numerous medical writers[7] have commented on the not infrequent occurence of genital manifestations during a typical nightmare. As with very acute anxiety attacks in the waking state, erection, orgasm and emission may accompany the acme of the attack. Waller,[13] a sufferer himself, naively accounts for these facts by attributing them to engorgement of the pudic arteries caused by the palpitation of the heart, though he does not explain the absence of them in the more common forms of cardiac palpitation. On the other hand, it may be said that few dreams culminating in emission are altogether free from some degree of anxious tension or even apprehension. Between these two extremes of the typical nightmare and the typical erotic dream lie an infinite variety of nocturnal experiences in which the erotic and the fearful show every possible inter-relationship with each other. A dream may begin in an erotic form and end in fear; it may begin with fear and end in a pleasurable erotic scene; or it may throughout consist of a varying mixture of the two emotions. It is clear that the psychopathological explanation of nightmare described earlier in this paper can fully account for these observations. When the repression is slight, so that its effect is practically nullified by the inhibition of the endopsychic censorship that occurs during sleep, an erotic desire, perhaps one which would be suppressed in waking moments, can come to imaginary fulfilment in a dream. When the repression is greater, the dream contains a mixture of pleasurable sensation and of discomfort or fear. When the repression is greater still, the fear may overshadow the voluptuous feeling, and in the extreme case of the typical nightmare it entirely replaces it.

The Nightmare in the Middle Ages

In accord with this explanation of the graded reciprocal relationship between the erotic and the fearful in this class of dreams is the theological classification of them that obtained in the Middle Ages. Medical teaching was beginning to be sceptical about the popular explanation of terror dreams as representing the assaults of lewd demons, but it was overruled by the Church, which was just then finding the beliefs in demons and witches a valuable weapon in its fight against heresy, with which it succeeded in identifying them. The doctrines of the Church appeared to take into account the same alternation of fearful and voluptuous feelings on the occasion of the visits of incubi, for they were concerned with the various attitudes on the part of the subjects towards these visits, particularly in respect of the strength of the resistance they manifested. The discussions on this point resembled very much a modern juristic investigation into a case of rape. The authors of the *Malleus Maleficarum*, for instance, divided such subjects into three classes: "(1) Those who voluntarily submit to incubi, as witches do; (2) those whom witches have brought together with incubi or succubi against their will; and (3) a third class, to which certain virgins in particular belong, who are plagued by incubus demons entirely against their will." An excellent example of the underlying attraction exerted by a wicked incubus is related with fine psychological insight by Goerres[14]; it reminds one of the resistance we encounter nowadays on endeavouring to get neurotic patients to renounce their symptoms:

"En 1643, je fus chargé par mes supérieurs d'aller exorciser une jeune fille de vingt ans qui était poursuivie par un Incube. Elle m'avoua sans détour tout ce que l'esprit impur faisait avec elle. Je jugeai, d'après ce qu'elle me dit, que malgré ses dénégations, elle prêtait au démon un consentement indirect. En effet, elle était toujours avertie de ses approches par une surexcitation violente des organes sexuels; et alors, au lieu d'avoir recours à la prière, elle courait à sa chambre et se mettait sur son lit. J'essayai d'éveiller en elle des sentiments de confiance envers Dieu; mais je n'y pus réussir, et elle semblait plutôt craindre d'être délivrée."

Clinical experience shows that the extent to which incest wishes may be accepted by the ego in dreams presents every possible variation, this depending on perfectly ascertainable factors. Parallel with this variation is the extent to which pleasure or fear respectively dominate the emotional colouring of the dream. This gradation would appear to correspond with the religious views that have obtained in all ages on the matter of carnal intercourse between mortals and supernatural beings. When fear predominated, the dream was ascribed to the brutal assault of a lustful demon, and I would direct special attention to the fact that both the popular name for the phenomenon—viz., nightmare, as well as the scientific designations of it, incubus or ephialtes, simply signify a lewd demon who visits by night. At the other end of the scale we get the numerous beliefs in carnal intercourse between mortals and divine beings which are common to almost all religions, including of course the Christian. I need hardly allude to the endless amours of the classical gods, nor to the characteristic feature that the product of such unions were exceptional people, from Alexander to Jesus, from Plato to Merlin. A particular by-product of the belief, the practice of "incubation" to cure impotence and sterility, is of special interest to us, since its chief exponent was Æsculapius, the father of our profession, and the word for the practice has received extensive connotations in our daily work.

From all that has been said we are, I think, justified in studying historically the ætiological views of the nightmare together with those of erotic dreams. The common ground between the two sets of ætiological views is remarkable, although the differences are none the less interesting. With both, the popular view, dating from prehistoric times and accepted in the main by the Church in the Middle Ages, was that the dreams in question, the pleasurable as well as the fearful, proceeded from a sexual wish on the part of some supernatural agent. The medical view, on the contrary, has been that both were due to physical causes in the dreamer's body. By the time the Middle Ages were reached the opinion was beginning to gain ground, particularly among physicians, that nocturnal pollutions had a purely physical origin. Gervasius of Tilbury, for instance, quotes this as the approved medical view in 1214, though he himself appears to have believed at the same time both in this ætiology and in the existence of lewd succubi. Later the curious compromise was reached that up to the year 1400 incubi were supposed to have had intercourse with human beings only against the will of the latter, but that after this date the appearance of a race of lecherous witches led to people giving themselves voluntarily to the incubi. It is apparent that, just when people were beginning to emancipate themselves from the belief in hallucinated beings in connexion with erotic dreams and retaining the belief only in connexion with nightmares, a theological elaboration of the incubus concept re-animated the ancient belief that the partner in a sexual dream was an actual being. Paracelsus showed a characteristic compromise in maintaining that the menstrual flux engendered phantoms in the air and that therefore convents were seminaries of nightmares. At a meeting of the *Bureau d'adresse* in 1656 the opinion was held that the belief in incubi was due to imaginings stirred by tension in the seminal vesicles, and this is still the orthodox medical teaching. Nocturnal emissions are proclaimed to be a beneficent device on the part of Nature to prevent men from being troubled by sexual wishes, or rather by the sense of guilt attaching to them—though this fails to account either for the fact that men often do not escape from the sense of guilt in this way, simply associating it with the emissions themselves, not for the fact that women, who have no seminal vesicles,

also suffer from erotic dreams. With erotic dreams the medical view dates from the twelfth century, and began to prevail over the popular view in the seventeenth. With the nightmare it was foreshadowed by classical medical writers—e.g., Galen, but began to prevail over the popular view only in the eighteenth century. The view presented here, which fuses the two others, was hinted at by Thomas Nashe in 1594 and Splittgerber in 1860, but was scientifically established by Freud only at the beginning of this century. The sexual origin of the nightmare, like that of hysteria, both well known until the knowledge was blotted out by the "scientific materialism"—using this term in its anti-psychological sense—of the past two hundred years, had to be discovered afresh in the twentieth century—and, appropriately enough, by the same man.

Both of these views, the popular and the medical, denied vigorously that either class of dream could be due to any wish in the dreamer's mind, and this is the essential point on which the modern psycho-analytical explanation lays stress. This explanation contains two theses: (1) that nightmares, like erotic dreams, are endogenic, arise from within the organism concerned, and (2) that they proceed from a sexual wish, one often repressed and hence overwhelmed and shrouded by fear. The popular view denied the first thesis, but accepted the second; the medical view denied the second, but accepted the first. In opposing the popular view the medical view rejected not only its error, but also its truth. The modern psycho-analytical view combines the truth there was in both.

More than this, we can now see the reason why error had to be introduced in the two cases, namely, as a defence against the sense of guilt that is ever present. The tendency has always been to avoid any personal responsibility for nocturnal erotic wishes, even those most lightly censured, and to ascribe them to some other agency. In the history of mankind we can clearly distinguish two stages in this respect. To begin with, the dream experiences were ascribed to the action of external personal agents, such as lewd demons; the wishes were, as a psychiatrist would say, projected outwards on to other beings. The second stage consisted in projecting the wishes on to various bodily processes, non-mental and non-sexual. We are even yet only beginning to emancipate ourselves from this form of projection, and the medical world in particular shows the greatest timidity in making this step.

Both the old popular view and the current medical one agreed in one fundamental respect—namely, in devising an explanation—for erotic dreams as well as for the nightmare—that divests the subject of any personal responsibility for his nocturnal erotic experiences. Both invoked the characteristic mechanism of projection for their purpose: the one projected the agency on to the outside world of spirits, the other on to inanimate processes in the body. Of the two, the popular view retained both the psychological and the sexual elements, and was thus nearer to the truth, particularly in the case of the nightmare, than is the present-day medical view. It was an advance to discard the belief in spirits and demons, but a retrogression to discard the psychical and erotic, for the supernatural beings at least possessed these attributes. For thousands of years the forces of internal repression—i.e., fear—made use of the supernatural projection to guard man against too near an insight into his own nature. When this defence began to fail, "scientific" materialism came to the rescue, but this has delayed the advent of psychological truth only for a couple of centuries, and the obstacle it interposes will not be so formidable as was the "spiritual" one.

REFERENCES

1. Hobbes, T.: Leviathan, 1651, chap. xii.
2. Galen, C.: Comment. ad. aph. Hippoc., Ed. Kühn, xvii., 2, pp. 628, 747.
3. Aeginata, Paulus: Sydenham Trans., vol. i., p. 388.
4. Moreau, J. J.: Ann. Med.-Psych., 1855, p. 361.
5. Burton, Robert: The Anatomy of Melancholy, 1621, ed. 1826, i., part 1, sect. iii., mem. 2, subsect. iv., p. 302.
6. Splittgerber, F.: Schlaf und Tod, 1866, p. 170.
7. Nashe, T.: Works, 1594, ed. R. B. McKerrow, 1904, i., 345, 386.
8. Jones, Ernest: Jour. Abn. Psych., vi. (Papers on Psycho-analysis, 3rd ed., 1923, p. 487).
9. Freud, S.: Sammlung kleiner Schriften zur Neurosenlehre aus den Jahren, 1893–1906.
10. Freud: Hemmung, Symptom und Angst, 1926.
11. Hansen, J.: Zauberwahn, Inquisition und Hexenprozess im Mittelalter, 1900, p. 138.
12. On the relation of diet in general to erotic dreams, see Spitta, H.: Die Schlaf- und Traumzustände der menschlichen Seele, 1882, p. 252.
13. Waller, J.: A Treatise on the Incubus or Nightmare, 1816, p. 55.
14. Goerres, J. J. von.: cited by J. Delassus, Les Incubes et les Succubes, 1887, p. 21.

PYRETIC TREATMENT OF G.P.I.

Dr. C. B. Bamford, in our issue of August 13th, reported somewhat unfavourably on diathermy fever as a substitute for malaria in general paralysis of the insane, and in a leading article a fortnight ago mention was made of some of its disadvantages. A rather more encouraging account, however, is given by Dr. G. P. Prior,[1] of New South Wales, who has treated three women and nine men by this method. He aims at maintaining a temperature of 103° F. for five or six hours, but in one or two cases the temperature rose to nearly 107° F. without lasting ill-effect. Burns were prevented by putting the patient in a canvas jacket or camisole to restrict the movements of the arms, and this had the further advantage of increasing the insulation. The current starts with a low milliamperage, and is raised to 3000 m.a. in half an hour, and left there until the patient perspires freely. The desired temperature is generally reached with a milliamperage between 3500 and 3800. When the temperature approaches 102° F. the patient becomes very uncomfortable, and is given morphine gr. ¼, hyoscine gr. 1/100. He is encouraged to drink warm water, the milliamperage is increased to between 3500 and 4000, and the current is turned off when the temperature reaches 104°. As a rule it rises another degree, and remains up until the patient is uncovered. The rate of fall can be partly controlled by the rate of removing the blankets or sponging. Usually the period is limited to five or six hours, since a longer pyrexia seems to exhaust the patient. Seven or eight treatments—in one case as many as 13—are given at intervals of two days. The pulse-rate rises and falls with the temperature, but not in proportion to it. The respiration increases slightly with the temperature, but never above 26 per minute. After a series of treatments Dr. Prior found a slight decrease in the red and white blood-cell count, and a pronounced shortening of the coagulation time. The specific gravity of the urine was raised, and the acidity and ammonia content greatly increased. The blood Wassermann reaction was changed from positive to partial positive or indefinite negative in four cases. In every case there was a decrease in the number of cells in the cerebro-spinal fluid and in the intensity of the colloidal gold or bicolour guaiacol test. The Wassermann reaction of the cerebro-spinal fluid was also modified in four cases, the globulin test in four cases, and the Takata Ara reaction in three. Despite the extreme perspiration, the loss of weight was not more than 5 or 7 lb.—except in one case—and was made up again in a few weeks. Five patients were much improved, and three were improved.

An accompanying paper in the same journal, by Dr. Clifford Henry, is devoted to malariotherapy. He does not regard a quinine-tolerance test as desirable, for a trace of quinine in the system may interfere with successful infection. If the patient is intolerant of quinine the fever should be terminated by neosalvarsan instead. The centrifugalised urine should always be examined for blood pigment before

[1] Med. Jour. Australia, June 25th, p. 882.

inoculation; a blood count and blood-sugar and hæmoglobin estimations should be made, and a blood film should be stained. Dr. Henry describes the technique and the complications which may arise, drawing special attention to urine tests for bile compounds, for quinine always damages the liver. He gives quinine hydrochloride grs. 5 in half an ounce of chloroform water three times a day for a week and once a day for another week, to stop the malaria. If the fever must be cut short urgently, quinine bihydrochloride grs. 5 in 10 c.cm. of normal saline are injected intravenously very slowly. Plasmoquine is given if the malaria turns out to be malignant, but it sometimes causes cyanosis. To make sure that the system is free from parasites, a subcutaneous injection of 3 c.cm. of Phlogetan is given, and centrifugalised urine is examined for blood pigment. An injection of 1 c.cm. of adrenaline solution may render parasites visible in the peripheral blood. The blood count and hæmoglobin content can be restored by a mixture of quinine, iron, strychnine, and arsenic. Dr. Henry does not think that subsequent treatment with the arsenobenzols improves the result. In his opinion the pyrexia is not the important factor, since patients improve even if they have had a normal temperature throughout. He suggests that the reticulo-endothelial system is stimulated by the malarial toxin to cast off macrophage cells from the endothelium of the blood-vessels as independent cells, and that the destruction of the treponema is accomplished by phagocytosis exerted by these macrophages, by plasmocytes, and by stellate Küpffer cells. If this explanation be correct, some new theory must be advanced to account for the success of diathermy.

CEREBRAL HÆMORRHAGE IN WHOOPING-COUGH

AMONG the complications of whooping-cough which damage the central nervous system, cerebral hæmorrhage is rare but well recognised. U. Beni [1] describes such a case in a girl aged 8. On the twentieth day of her illness, and six days after the onset of a bronchopneumonia, a left hemiplegia supervened after an unusually violent attack of coughing. The child was admitted to hospital in a semi-conscious condition with a complete paralysis of the left arm and leg. Examination of the urine and of the cardiovascular system was negative. The differential diagnosis was between hæmorrhage, embolus, and tumour of the brain; meningeal hæmorrhage; and encephalitis. The history and absence of signs of increased intracranial pressure were against tumour. No source for an embolus was found, and the completeness and suddenness of the hemiplegia were against a meningeal hæmorrhage. In encephalitis, pyrexia usually precedes the appearance of focal cerebral symptoms, whereas in the present case the order of these was reversed. No lumbar puncture was done, but the child made a good recovery; 19 days after admission she was able to walk, and there was a full return of power in the left arm.

THE AFRICAN NATIVE: HIS UNFITNESS

IN his Chadwick Public Lecture, now reprinted from the *East African Medical Journal*, Dr. J. H. Sequeira spoke of the gravity of the native health problem in tropical countries, using his personal knowledge of Kenya as an example. Far from being, as many have supposed, singularly healthy when on their native heath or in their forest home, few of the natives of this colony are what the European would call fit. Malaria, yaws, helminthiasis, and plague are endemic, and the infant mortality in some areas is as high as 400 per 1000 live births. The spread of disease is favoured by the ignorance of the people and by the insanitary conditions under which they live, but public health officials find it impossible to tackle these problems without some knowledge of anthropology and psychology. The average mentality of a Kenya native is equal to that of a European child of 8 or 9 years; the best method of approach to him has been found to be through the instincts of self-preservation and reproduction. Dr. Sequeira considers that the gradual breaking down of the native's distrust of European medicine has largely been due to the fact that he is beginning to learn that the white man's medicine is able to prevent abortions and stillbirths. Native superstitions and customs are often barriers to advance, and the best hope of circumventing these seems to lie in the training of native teachers who will carry the principle of hygiene into their own villages. At the Jeanes School, founded by the government in 1925, men selected by the missions are trained as teachers. They are afterwards employed in the Reserves to improve the work of the village schools and to promote the good health and well-being of the people. The training course lasts two years, and not only the men themselves but their wives and children receive instruction. The fact that the teacher's wife has learned to keep herself, her children and her house clean provides a valuable object lesson in village communities. The teacher is trained to teach in school and also to cultivate his land, and to undertake simple carpentry; on leaving the Jeanes School he is presented with a set of tools. The initiative faculty which is a characteristic of the African native is strongly in favour of the spread of public health teaching. The native teachers are visited periodically, and return to the school for an annual refresher course. Educational work has benefited greatly from increasing facilities of transport, and especially the motor-car, which has linked up places formerly separated by days or even weeks of travelling.

[1] Morgagni, July 31st, p. 985.

MALAYAN MEDICAL SERVICE.—We are asked to state that all temporary allowances in this service (see THE LANCET, August 27th, p. 482) were abolished at the beginning of this year.

Appointments

ROBERTS, ELIZABETH K., M.B., B.Ch., B.A.O. Dub., has been appointed Resident Physician to the Liverpool Royal Children's Hospital.

ROBINSON, H. J., M.D., Ch.B., B.A.O. Dub., Resident Assistant Physician at Montana Hall (The British Sanatorium), Montana, Switzerland.

ROSS, J. COSBIE, Ch.M. Liverp., F.R.C.S. Eng., Visiting Surgeon to Smithdown-road Municipal Hospital, Liverpool.

Certifying Surgeons under the Factory and Workshop Acts: BENNETT, A. (Sandbach District, Chester); KENEFICK, R. (Llantrisant District, Glamorgan); MCMILLAN, J. (Wallasey District, Chester).

Births, Marriages, and Deaths

BIRTHS

CAPELL.—On August 26th, at Mildenhall, Suffolk, the wife of L. F. Capell, M.B., Ch.B. Edin., of a daughter.

HAMILTON.—On August 26th, at Bere Alston, S. Devon, the wife of H. A. R. Hamilton, M.R.C.S. Eng., L.R.C.P. Lond., of twin sons.

MURRAY.—On August 25th, at Breinton Lodge, Hereford, the wife of C. P. Murray, M.B., Ch.B. Aberd., West African Medical Staff, of a daughter.

MARRIAGES

FERGUSON—STUART.—On August 23rd, at St. George's Church, Hanover-square, London, Harry Reece Ferguson, M.R.C.S. Eng., L.R.C.P. Lond., to Kathleen Amy, daughter of Mr. and Mrs. Robin Stuart, of Buenos Aires.

DEATHS

KELSO.—On August 5th, at Edgewood, British Columbia, John Edward Harry Kelso, M.D. Edin., younger son of the late Colonel Andrew Kelso, of Ashbrook, Edinburgh, aged 72.

KENDALL.—On August 19th, at his residence, Nonus, King's Drive, Eastbourne, George Kendall, M.R.C.S. Eng., L.R.C.P. Lond., formerly of Battle, Sussex, aged 73.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.